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Moloch Horridus

The Bug-eyed Monster on the cover this month is truly bug-eyed—or, rather, ant-eyed—and a monster by most standards. It is, surprisingly, a gentle and inoffensive creature, at least to anything too large to be eaten. This fortunately includes humans and all other animals larger than ants. Ants—especially Australian ants—are in difficulty, since it consumes a thousand to fifteen hundred of them at a sitting! (Squatting?)

The beast is in reality Moloch Horridus, alias The Mountain Devil, Thorny Devil, or just plain Moloch.

Molochs are classified as reptiles (Class Reptilia), lizards (Order Sauria), agamids (Family Agamidae) and molochs (Genus Moloch)—(Species Horridus).

The agamids are an Old World family of lizards equivalent to, and roughly paralleling, the American iguanids—which contain most of the typical American lizards—the chuckwallas, the swifts, horned lizards and of course the Iguanas.

The Moloch is in fact the Australian equivalent of our own horned toad (lizard). Both of them eat ants, lay eggs, inhabit sandy areas, and prove quite a mouthful to predators. The Moloch is the longer of the two, running eight inches to *Phrynosomas*, four or five, but its tail accounts for most of the difference.

The Moloch would seem to make an interesting—if not unique—pet.

John Schoenherr.



THREE DEGREES OF FREEDOM ...

THE concept of "degrees of freedom" as used in thermodynamics does not imply quantitative measure of freedom, as in "degrees of angele" or "degrees Farenheit", but the number of different kinds of freedom available to units of the system under discussion. A particle may have freedom to vibrate, but not to move, as an atom locked in a crystal latice. A gas molecule may be free to move linearly, to vibrate internally, and to spin around several axes. The total energy of the system will be distributed amone the various

available degrees of freedom.

When we speak, today of "a fire society" or "the free world"—perhaps it would be advantageous to consider the "degrees of freedom" concept the thermodynamacist uses. In essence, the famous "Four Freedoms" were stated to call attention to the fact that freedom is not one thing, like the right to vote, or the right to two ships as you choose. There are many degrees of freedom in a society; their interrelationships are extremely complex, and have more cross-compounded degrees of coupling than any thermodynamicist ever tried working out for the heat equation of interacting matter!

Let's consider the four primary classifications of forces in a culture; Political, Social, Religious and Economic. A given culture may be absolutely rigid, with zero freedom on one of those factors, while quite liberal on the others; it can, then, point to one of the liberal factors, and say pridefully, "We are a free society!" While you can point to the rigid factor, and properly

say that it's a decidedly not-free culture. Who's right, then .

To understand clearly the extreme degree of variation possible, let's consider the culture of Alphastan. Alphastan has an absolute anarchial political system; there is no ruler, there are no laws, and no courts. There are no criminals, because there is nothing illegal, and it's impossible to commit a crime.

Yet the people of Alphastan are sober, well-disciplined, scrupulously honest.

—a well-ordered culture indeed. There are no judges, no police—and yet

the citizenry is extremely orderly.

Of course, the Alphastanese do have some interesting social traditions. For instance, any man guilty of kissing his wife in public, is immediately stoned to death by those around. The wife is not stoned; she must, of course, do what her husband commands, so she's not guilty. However, naturally she's burned alive on her husband's subsequent funeral pyre, as prescribed by the common traditions of Society.

Now this, you understand, is a completely free culture; there are no laws,

no police, no courts, no jails, and no criminals. A pure anarchy of absolute political freedom.

It happens that Alphastan does have some rather rigid and very powerful

social customs, but that has nothing to do with political freedom.

Then we can consider the peculiar situation in Palestine, at about the years 30-50 AD. The Jews, at that time, had no political power; they'd been conquered and were being ruled by Rome. They did have considerable political freedom, none the less, because the Roman laws, at that period, were reasonably sound and wise—and were pretty honestly administered. One of those laws had to do with granting religious freedom to conquered peoples—which worked quite well in most situations. The Jewish state, however, happened to be a theocracy; it had a religious system allowing almost zero freedom. So, although the Jewish High Priest had no political power, under Roman Law, Pontius Pilate was legally forbidden to interfere in a certain local religious matter.

About a generation later, Rome was forced to do something about that situation—but the peculiar characteristics of Political vs. Religious freedom are such that while Israel could be destroyed as a political entity—as a theorartic state, it could, and did, continue to exist in every culture that allowed religious freedom. The right of a religion to destroy its violators—called "heretics" instead of "emimals"—has, in almost every human society,

been acknowledged either de jure or de facto.

Since Israel is in basic concept a religious power, rather than a political power, it must, necessarily, have very little religious freedom—but can have

great deal of political freedom!

Alphastan, remember, doesn't need laws, courts, or police to maintain order among its citizens—it can afford absolutely unlimited political freedom. But it can not allow any social freedom, and the cross-coupling between degrees of freedom in human societies is such that you can be fairly sure

that Alphastan will have very narrow religious freedom.

Economic freedom does not appear to be an independent variable; it may be, but it seems rather to be a sub-set of social freedom, heavily interactive with it. Notice that, in most religious orders, renouncing society almost automatically includes renouncing economics. A true communist system—and be it noted that Communism is something quite different from true communism—is a sort of economic anarchy, and is perfectly workable, as has been demonstrated again and again. Provided that, as in Alphastan, an extremely powerful social mechanism establishes oustomary behavior—and enforces it—of such a nature as to make it work. That is, instead of it being illegal for a natural-born slob to take, missue, and destroy communal goods, it becomes ill-mannered. And while the genius who is a major benefactor of the community gets no larger pay, it is considered good manners to insist that he live in the most desirable quarters, have the best food, etc.

In a religious commune, a monastery, for instance, you'll usually find

that the Abbott does have certain traditional privileges.

I suspect that a quite rigid mathematical analysis of cultures could be worked out along the general outline of thermodynamics—a system that recognized the multiple degrees of freedom that divide the energies of a human community.

In one respect, at least, there is a resemblance to thermodynamics. In consideration of heat energy, the total quantity of heat in a system is not an adequate measure of the energy that can be made available in the system. A system which was all at a temperature of 250° C. would contain a large amount of heat energy. — But no available energy. A system at, say, an average temperature of 250° C., but with some parts at 50° and others at 50° contains much less energy—but far more energy available for doing work.

The level of a culture has nothing directly to do with the dynamism of that culture; the differentials within the culture—or within it and its effectively interacting neighbors—does measure the ability of the culture to achieve. In each degree of freedom, then, we need to look at both the level, and the range

of that freedom.

A primitive Tribal system is characterized by having the Social forces absolutely dominant over all others, and having zero permissible rage. It's perfectly possible to imagine a far-future culture with an intergalactic level of technology, a social system of immense intrice, at a very high level indeed... but which had zero range. It would then be a system having total social entropy, at a high content level—and like any total-entropy system, there would be no energy available for achievement. In other words, it would be a perfectly static system, going on for milleniums, with no more changes than the ancient patterns of primitive tribal life showed.

Incidentally, observe very carefully that practically every one of the 10¹⁴ or so individuals in the culture would like it, and be personally markedly more content than people of today. Powerful social forces tend to act as an extremely effective selective-breeding system; by the time that super-tribe was established, the social forces would have narrowed the variations in human types down to such a degree that only those individuals who liked that way of life were born! Observe around you that most people today like a stable,

non-dynamic culture; it's easier that way. . . .

The level at which a stasis sets in makes no difference; the stasis occurs because the range of a degree of freedom has been narrowed to, or nearly to, zero.

Political freedom can, similarly, be narrowed to zero, at any level of freedom. The fact that a nation does, or does not, have a one-party government has practically nothing to do with the level and range of political freedom in that nation. Certainly we can imagine a nation with two well-established political parties, open, free elections on a popular demoratic basis, in which nation, however, the parties are the Tweedledom and the Tweedlede parties. Two parties that think as one, two "leaders" with but a single idea.

On the other hand, imagine a nation with one, and only one political party, elections open only to a limited group of the citizens—but wide-open, all-out, hammer-and-tongs battles within the party to determine which definitely different philosophy of leadership shall be exercised this term. (I'm not talking about the Nazi or Russian system, however; it's necessary to make the additional stipulation that the losers in the political struggle are protected by a Social system that keeps the winners from killing off the losers. The one really critical proposition in Robert's Rules of Order for Parliamentary procedure is that the opposition shall always be dealt with as "The Honorable Opposition." One establish that, and the rest of the Rules of Order are of convenience, rather than necessity). (Continued on page 126)

ANYTHING

YOU CAN DO!



First of two parts

by

Darrell T. Langart

The Alien was really alien—and Earth was faced with a strange problem indeed. They had to have a Superman, and there weren't any. So...

LIKE some great silver-pink fish, the ship sang on through the eternal night. There was no impression of swimming; the fish shape had neither fins nor a tail. It was as though it were hovering in wait for a member of some smaller

species to swoop suddenly down from nowhere, so that it, in turn, could pounce and kill.

But it still moved.



Only a being who was thoroughly familiar with the type could have told that this fish was dying.

In shape, the ship was rather like a narrow flounder—long, tapered, and oval in cross-section—but it showed none of the exterior markings one might expect of either a living thing or of a spaceship. With one exception, the smooth, silver-pink exterior was featureless. That one exception was a long, purplish-black, roughened discoloration that ran along one side for almost half of the

ship's seventeen meters of length. It was the only external sign that the ship

was dving.

Inside the ship, the Nipe neither knew nor cared about the discoloration. Had he thought about it, he would have deduced the presence of the burn, but it was the least of his worries. The internal damage that had been done to the ship was by far the more serious. It could, quite possibly, kill him.

The Nipe, of course, had no intention of dying. Not out here. Not so far, so very far, from his own people. Not out here, where his death would be so

very improper.

He looked at the ball of the vellow-white sun ahead and wondered that such a relatively stable, inactive star could have produced such a tremendously energetic plasmoid that it could still do the damage it had done so far out. It had been a freak, of course. Such suns as this did not normally produce such energetic swirls of magnetic force,

But the thing had been there, nonetheless, and the ship had hit it at high velocity. Fortunately, the ship had only touched the edge of the swirling cloud, otherwise the entire ship would have vanished in a puff of incandescence, But it had done enough. The power plants that drove the ship at ultralight velocities through the depths of interstellar space had been so badly damaged that they could only be used in short bursts, and each burst brought them nearer to the fusion point. Most of the instruments were powerless; the Nipe was not even sure he could land the vessel. Any attempt to use the communicator to call home would have blown the ship to atoms.

The Nipe did not want to die, but, if die he must, he did not want to die foolishly.

It had taken a long time to drift in from the outer reaches of this sun's planetary system, but using the power plants any more than absolutely neces-

sary would have been foolhardy.

The Nipe missed the companionship his brother had given him for so long; his help would be invaluable now. But there had been no choice. There had not been enough supplies for two to survive the long fall inward toward the distant sun. The Nipe, having discovered the fact first, had, out of his mercy and compassion, killed his brother while the other was not looking. Then, having eaten his brother with all due ceremony, he had settled down to the long, lonely wait.

Beings of another race might have cursed the accident that had disabled the ship, or regretted the necessity that one of them should die, but the Nipe did neither, for, to him, the first notion would have been foolish, and the

second incomprehensible.

But now, as the ship fell ever closer toward the yellow-white sun, he began to worry about his own fate. For a while, it had seemed almost certain that he would survive long enough to build a communicator-for the instruments had already told him and his brother that the system ahead was inhabited by creatures of reasoning power, if not true intelligence, and it would almost certainly be possible to get the equipment he needed from them. Now, though, it looked as if the ship would not survive a landing. He had had to steer it away from a great gas giant, which had seriously endangered the power plants.

He did not want to die in space-wasted, forever undevoured. At least, he must die on a planet, where there might be creatures with the compassion and wisdom to give his body the proper ingestion. The thought of feeding

inferior creatures was repugnant, but it was better than rotting to feed monocells or ectogenes, and far superior to wasting away in space.

Even thoughts such as these did not occupy his mind often or for very long. Far, far better than any of them was the desire and planning for survival.

The outer orbits of the gas giants had been passed at last, and the Nipe fell on through the sateroid best without approaching any of the larger pieces of rock-and-metal. That he and his brother had originally elected to come into this system along its orbital plane had been a mixed bessing; to have come in at a different angle would have avoided all the debris—from planetary size on down—that is thickest in a star's equatorial plane, but it would also have meant a greater chance of missing a suitable planet unless too much reliance were placed on the already weakened power generators. As it was, the Nipe had been able to use the gravitational field of the gas giant to swing his ship toward the precise spot where the third planet would be when the ship arrived in the third orbit. Moreover, the third planet would be retreating from the Nipe's line of flight, which would make the velocity difference that much the less.

For a while, the Nipe had toyed with the idea of using the mining bases that the local life form had set up in the asteroid belt as bases for his own operations, but he had decided against it. Movement would be much freer and much more productive on a planet than it would be in the Belt.

He would have preferred using the fourth planet for his base. Although much smaller, it had the same reddish, ard look as his own home planet, while the third world was three-quarters drowned in water. But there were two factors that weighed so heavily against that choice that they rendered it impossible. In the first place, by far the greater proportion of the local inhabitants' commerce was between the asteroids and the third planet. Second, and much more important, the fourth world was at such a point in her orbit that the energy required to land would destroy the ship beyond any doubt.

It would have to be the third world.

As the ship fell inward, the Nipe watched his pitifully inadequate instruments, doing his best to keep tabs on every one of the feebly-powered ships that the local life form used to move through space. He did not want to be spotted now, and even though the odds were against these beings having any instrument highly developed enough to spot his craft, there was always the possibility that he might be observed optically.

So he squatted there in the ship, a centipode-like thing about five feet in length and a little less than eighten inches in diameter, with eight articulated limbs spaced in pairs along his body, any one of which could be used as hand or foot. His head, which was long and snouted, displayed two pairs of volet eyes which kept a constant watch on the indicators and screens of the few instruments that were still functioning aboard the ship.

And he waited as the ship fell toward its rendezvous with the third planet.

October, but here in the tundra country the wind had a tendency to be chill and biting in the morning, even at this time of year. Within a week or so, he'd have to start using the power pack on his horse to electrically warm his protective clothing and the horse's wrappings, but there was no necessity of that yet. He smiled a little as he always did when he thought of his grandfather's remarks about such "new-fangled monsense".

"Your ancestors, son of my son," he would say, "conquered the tundra and lived upon it for thousands of years without the need of such womanish things. Are there no men anymore? Are there none who can face nature alone

and unafraid without the aid of artifices that bring softness?"

But Wang Kulichenko noticed—though, out of politeness, he never pointed it out—that the old man never failed to take advantage of the electric warmh of the house when the short days came and the snow blew across the country like fine white sand. And he never complained about the lights or the television or the hot water, except to grumble occasionally that they were a little old and out of date and that the mail-order catalog showed that better models were available in Vladivostok 1.

And Wang would remind the old man, very gently, that a paper-forest ranger made only so much money, and that there would have to be more saving before such things could be bought. He did not—ever—remind the old man that he, Wang, was stretching a point to keep his grandfather on the payroll as an assistant.

Wang Kulichenko patted his horse's rump and urged her softly to step up her pace just a bit. He had a certain amount of territory to cover, and, although he wanted to be careful in his checking, he also wanted to get home early.

Around him, the neath-planted forest of paper-trees spread knotty, alien branches, trying to catch the rays of the winter-waning sun. Whenever Wang thought of his grandfather's remarks about his ancestors, he always wondered, as a corollary, what those same ancestors would have thought about a forest growing up here, where no forest like this on had ever grown before.

They were called paper-trees because the bulk of their pulp was used to make paper (they were of no use whatever as lumber), but they weren't trees, really, and the organic chemicals that were leached from them during the

pulping process were of far more value than the paper pulp.

They were mutations of a smaller plant that had been found in the temperate regions of Mars and purposely changed genetically to grow on the Siberian tundra, where the conditions were similar to, but superior to, their natural habitat. They looked as though someone had managed to cross breed the Joshua tree with the cypress and then persuaded the result to grow grass instead of leaves.

In the distance, Wang heard the whining of the wind and he automatically pulled his coat a little tighter, even though he noticed no increase in the wind velocity around him.

Then, as the whine became louder, he realized that it was not the wind. He turned his head toward the noise and looked up. For a long minute, he watched the sky as the sound gained volume, but he could see nothing at first. Then he caught a glimpse of motion. A dot that was hard to distinguish against the cloud mottled gray sky.

What was it? An air transport in trouble? There were two trans-polar routes

that passed within a few hundred miles of here, but no air transport he had ever seen had made a noise like that. Normally, they were so high as to be both invisible and insudible. Must be trouble of some set

both invisible and inaudible. Must be trouble of some sort.

He reached down to the saddle pack without taking his eyes off the moving

speck and took out the radiophone. He held it to his ear and thumbed the call button insistently.

Grandfather, he thought with growing irritation as the seconds passed,

wake up! Come on, old dozer, rouse yourself from your dreams!

At the same time, he checked his wrist compass and estimated the direction of flight of the dot and its direction from him. He'd at least he able to give the airline authorities some information if the ship fell. He wished there were some way to triangulate its height and so on, but he had no need for that kind of thing, so he hadn't the equipment.

"Yes? Yes?" came a testy, dry voice through the earphone.

Quickly, Wang gave his grandfather all the information he had on the flying thing. By now, the whine had become a shrill roar, and the thing in the air had become a silver-pink fish shape.

"I think it's coming down very close to here," Wang concluded. "You call the authorities and let them know that one of the aircraft is in trouble. I'll see if I can be of any help here. I'll call you back later."

"As you say," the old man said hurriedly. He cut off.

Wang was beginning to realize that the thing was a spaceship, not an airship. By this time, he could see the thing more clearly. He had never actually seen a spacecraft, but he'd seen enough of them on television to know what they looked like. This one didn't look like a standard type at all, and it didn't behave like one, but it looked even less like an airship, and he knew enough to know that he didn't necessarily know every type of spaceship ever bulk.

In shape, it resembled the old rocket-propelled jobs that had been first used for space exploration a century before, rather than looking like the fat ovoids that he was used to. But there were no signs of rocket exhausts, and vet the

ship was very obviously slowing, so it must have an inertia drive.

It was coming in much lower now, on a line north of him, headed almost due east. He urged the mare forward, in order to try to keep up with the craft, although it was obviously going several hundred miles per hour—hardly a horse's pace.

Still, it was slowing rapidly-very rapidly. Maybe-

He kept the mare moving.

The strange ship skimmed along the treetops in the distance and disappeared from sight. Then there was a thunderous crash, a tearing of wood and foliage, and a grinding, plowing sound.

For a few seconds afterward, there was silence. Then there came a soft rumble, as of water beginning to boil in some huge, but distant samovar. It seemed to go on and on and on.

And there was a bluish, fluctuating glow on the horizon.

Radioactivity? Wang wondered. Surely not an atomic-powered ship without safety cutoffs in this day and age.

He pulled out his radiophone and thumbed the call button again. This time, there was no delay. "Yes?"

"How are the radiation detectors behaving there, Grandfather?"

"One moment. I shall see." There was a silence, then: "No unusual activity, young Wang. Why?"

Wang told him, then asked: "Did you get hold of the air authorities?" "Yes. They have no missing aircraft, but they're checking with the space

fields. The way you describe it, the thing must be a spaceship of some kind." "I think so, too. I wish I had a radiation detector here, though. I'd like to know whether that thing is hot or not. It's only a couple of miles or so away. I think I'd better stay away. Meanwhile, you'd better put in a call to Central Headquarters Fire Control. There's going to be a holocaust if I'm any judge

unless they get here fast with plenty of equipment." "I'll see to it," said his grandfather, cutting off.

The bluish glow in the sky had quite died away by now, and the distant rumbling was gone, too. And, oddly enough, there was not much smoke in the distance. There was a small cloud of gray that rose, streamerlike, from where the glow had been, but even that faded away fairly rapidly in the chill breeze. Quite obviously, there would be no fire. After several more minutes of watching, he was sure of it. There couldn't have been much heat produced in that explosion-if it could really be called an explosion.

Then he saw something moving in the trees between himself and the spot where the ship had come down. He couldn't quite see what it was, but it looked

like someone crawling.

"Hello, there!" he called out. "Are you hurt?"

There was no answer. Perhaps whoever it was didn't understand Russian. Wang's command of English wasn't too good, but he called out in that

Still there was no answer. Whoever it was had crawled out of sight.

Then he realized that it couldn't be anyone crawling. No one could even have run the distance between here and the ship in the time since it had hit, much less crawled.

He frowned. A wolf, then? Possibly. They weren't too common, but there were still plenty of them around.

He unholstered the heavy pistol at his side.

And, as he slid the barrel free, he became the first human being ever to see the Nipe.

For an instant, as the Nipe came out from behind a tree fifteen feet away, Wang Kulichenko froze as he saw those four baleful violet eves glaring at

him from the snouted head. He jerked up the pistol to fire.

He was much too late. His reflexes were too slow by far. The Nipe launched itself across the intervening space in a blur of speed that would have made a leopard seem slow. The alien's hand slapped aside the gun with a violence that broke the man's wrist, while other hands slammed at his skull.

Wang Kulichenko hardly had time to be surprised before he died.

The Nipe stood quietly for a moment, looking down at the thing he had killed. His stomach churned with disgust. He ignored the fading hoofbeats of the slave-animal from which he had knocked the thing that lay on the ground with a crushed skull. The slave-animal was unintelligent and unimportant.

This was the intelligent one.

But so slow! So incredibly slow! And so weak and soft!



It seemed impossible that such poorly-equipped beasts could have survived long enough on any world to evolve to become the dominant life form.

Perhaps it was not the dominant form. Perhaps it was merely a higher slave-animal. He would have to do more investigating.

He picked up the weapon the thing had drawn and examined it carefully. The mechanism was unfamiliar, but a glance at the muzzle told him that it was a projectile weapon of some sort. The twisted grooves in the barrel were obviously designed to impart a spin to the projectile, to give it gyroscopic stability while in flight.

The dead thing must have thought he was a wild animal, the Nipe decided. Surely no being would carry a weapon for use against members of its own or

another intelligent species.

He examined the rest of the equipment on the thing. Not much information there. Too bad the slave-animal was gone; there had apparently been more equipment strapped to it.

The next question was, what should he do with the body?

Devour it properly, as one should with a validly slain foe?

It didn't seem that he could do anything else, and yet his stomach wanted to rebel at the thought. After all, it wasn't as if the thing were really a proper being. It was astonishing to find another intelligent race; none had ever been found before. But he was determined to show them that he was civilized and intelligent, too.

On the other hand, they were obviously of a lower order than the Nipe, and that made the question even more puzzling.

In the end, he decided to leave the thing here, for others of its kind to find. They would doubtless consume it properly.

And-he glanced at the sky and listened-they would be here in time.

There were aircraft coming.

He would have to leave quickly. He had to find one of their production or supply centers, and he would have to do it alone, with only the equipment he had on him. The utter destruction of his ship had left him seriously hampered.

He began moving, staying in the protection of the trees. His ethical sense still bothered him. It was not at all civilized to leave a body to the mercy of lesser animals or monocells like that. What kind of monster would they

think he was?

Still, there was no help for it. If they had caught him while feeding, they might have thought him a lower animal and shot him. He couldn't put an onus like that upon them.

He moved on.

Ш

Two-fifths of a second. That was all the time Bart Stanton had from the first moment his supersensitive ears heard the faint whisper of metal against leather.

He made good use of it.

The noise had come from behind and slightly to the left of him, so he drew his own gun with his left hand and spun to his left as he dropped to a crouch. He had turned almost completely around, drawn his gun, and fired three shots before the other man had even leveled his own weapon.

The bullets from Stanton's gun made three round spots on the man's jacket, almost touching each other and directly over the heart. The man

blinked stupidly for a moment, looking down at the round spots.

"My God," he said softly.

Then the man returned his weapon slowly to his holster.

The big room was noisy. The three shots had merely added to the noise of the gunfire that rattled intermittently around the two men. And even that gunfire was only a part of the cacophony. The tortured molecules of the air in the room were so besieged by the beat of drums, the blare of trumpets, the crackle of lightning, the rumble of heavy machinery, the squawks and shricks of horns and whistles, the rustle of autumn leaves, the machine-gun sapa of popping popcorn, the clink and jingle of falling coins, and the yelps, bellows, howls, roars, snarls, grunts, bleats, moos, purrs, cackles, quacks, chirps, buzzes, and hisses of a myriad of animals, that each molecule would have thought that it was being showed in a hundred thousand different directions at once if it had a mind to think with.

The noise wasn't deafening, but it was certainly all-pervasive.

Bart Stanton had reholstered his own weapon and half opened his lips

to speak when he heard another sound behind him.

Again he whirled, his guns in hand—both of them this time—and his foreingers only fractions of a millimeter from the point that would fire the hair triggers.

But he did not fire.

The second man had merely shifted the weapons in his holsters and then dropped his hands away.

The noise, which had been flooding into the room over the speaker system, died instantly.

Stanton shoved his guns back into place and rose from his crouch, "Real

cute," he said, grinning. "I wasn't expecting that one."

The man he was facing smiled back, "Well, Bart, maybe we've proved our point. What do you think, Colonel?" The last was addressed to the third man, who was still standing quietly, looking worried and surprised about the three spots on his jacket that had come from the special harmless projectiles in Stanton's gun.

Colonel Mannheim was four inches shorter than Stanton's five-ten, and was fifteen years older. But, in spite of the differences, he would have laughed at anyone who had told him, five minutes before, that he couldn't outdraw

a man who was standing with his back turned.

His bright blue eyes, set deep beneath craggy brows in a tanned face, looked speculatively at the younger man. "Incredible," he said gently. "Absolutely incredible." Then he looked at the other man, a lean civilian with mild blue eyes a shade lighter than his own, "All right, Dr. Farnsworth; I'm convinced. You and your staff have quite literally created a superman. Anyone who can stand in a noise-filled room and hear a man draw a gun twenty feet behind him is incredible enough. The fact that he could and did outdraw and outshoot me after I had started . . . well, that's almost beyond comprehension."

He looked back at Bart Stanton, "What's your opinion, Mr. Stanton?

Think you can handle the Nipe?"

Stanton paused imperceptibly before answering, while his ultrafast mind considered the problem and arrived at a decision. Just how much confidence should be show the colonel? Mannheim was a man with tremendous confidence in himself, but who was capable of recognizing that there were men

who were his superiors in one field or another. "If I can't dispose of the Nipe," Stanton said, "no one can."

Colonel Mannheim nodded slowly. "I believe you're right," he said at last. His voice was firm with inner conviction. He shot a glance at Farnsworth. "How about the second man?"

Farnsworth shook his head, "He'll never make it. In another two years, we can put him into reasonable shape again, but his nervous system just couldn't stand the gaff."

"Can we get another man ready in time?"

"Hardly. We can't just pick a man up off the street and turn him into a superman. Even if we could find another subject with Bart's genetic possibilities, it would take more time than we have to spare.

"This isn't magic, Colonel. You don't change a nobody into a physical and mental giant by saying abracadabra or by teaching him how to pronounce shazam properly.

"I'm aware of that," said Colonel Mannheim without rancor. "Five years of work on Mr. Stanton must have taught you something, though. I should think you could repeat the process in less time."

Farnsworth repeated the head-shaking. "Human beings aren't machines, Colonel. They require time to heal, time to learn, time to integrate themselves. Remember that, in spite of all our increased knowledge of anesthesia, antibiotics, viricides, and obstetrics, it still takes nine months to produce a baby.

We're in the same position, only more so."

"I see," said Mannheim.

"Besides," Dr. Farnsworth continued, "Stanton's body and nervous system are now close to the theoretical limit for human tissue. I'm afraid you don't realize what kind of mental stability and organization are required to handle the equipment he now has."

"I'm sure I don't," the colonel agreed, "I doubt if anyone besides Stanton

himself knows."

Dr. Farnsworth's manner softened a little. "You're probably quite right. Suffice it to say that Bartholomew Stanton is the only answer we've found so far, and the only answer visible in the foreseeable future to the problem posed by the Nipe.

The colonel's face darkened. "I keep hoping that our policy of handling the Nipe hasn't been a mistake. If it has, it's going to prove a fatal one-

for the whole race."

"Let's go into the lounge," Farnsworth said. "Standing around in an empty chamber like this isn't the most comfortable way to discuss the fate of mankind." His voice brought hollow echoes from the walls.

Colonel Mannheim grinned at the touch of lightness the biophysicist had injected into the conversation. "Very well. I could do with some coffee, if

you have some."

"All you want," said Dr. Farnsworth, leading the way toward the door of the chamber and opening it. "Or, if you'd prefer something with a little more power to it-?"

"Thanks, no. Coffee will do fine," said Mannheim, "How about you,

Mr. Stanton?"

Bart Stanton shook his head, "I'd love to have some coffee, but I'll leave the alcohol alone. I'd just have the luck to be finishing a drink when our friend, the Nipe, popped in on us. And when I do meet him, I'm going to need every microsecond of reflex speed I can scrape up."

They walked down a soft-floored, warmly-lit corridor to an elevator which whisked them up to the main level of the Neurophysical Institute Building.

Another corridor led them to a room that might have been the common room of one of the more exclusive men's clubs. There were soft chairs and shelves of books and reading tables and smoking stands, all quietly luxurious. There was no one in the room when the three men entered.

"We can have some privacy here," Dr. Farnsworth said. "None of the rest of the staff will come in until we're through."

Colonel Mannheim looked at the biophysicist speculatively. "You seem to think secrecy's important all of a sudden."

Bart Stanton grinned and kept silent.

Dr. Farnsworth went over to a table, where an urn of coffee radiated soft warmth. "Cream and sugar over there on the tray," he said as he began to fill cups.

"Frankly," Colonel Mannheim said, "I was going to ask you to find us a place where we could talk privately. You seem to have anticipated me."

"I thought you might have something like that in mind," said Dr. Farns-

worth without looking up.

The cups were filled and the three men sat down in a triangle of chairs before any of them spoke again. Colonel Mannheim took a sip from his cup and then looked up.

"All right, we'll begin this way. Mr. Stanton, granted that you've been through five years of hell—but how closely have you stayed in touch with

the Nipe situation?"

"As best I could through news bulletins and information that your office

has sent here."

"Could you give me an oral summary?"
Bart Stanton thought for a moment. It was true that he'd been out of touch with what had been going on outside the walls of the Neurophysical Institute for the past five years. In spite of the reading he'd done and the

newscasts he'd watched and the TV tapes he'd seen, he still had no real feeling for the situation.

There were hazy periods during that five years. He had undergone extensive glandular and neural operations of great delicacy, many of which had resulted in what could have been agenizing pain without the use of suppressors. As a result, he possessed a biological engine that, for sheer driving power and nicety of control, surpassed any other known to exist or to have ever existed on Earth—with the possible exception of the Nipe. But those five years of rebuilding and retraining had left a gan in his life.

Several of the steps required to make the conversion from man to superman had resulted in temporary insanity; the wild, swinging imbalances of glandular secretions seeking a new balance, the erratic mistrings of neurones as they attempted to adjust to higher never-impulse velocities, and the sher fatigue engendered by cells which were acting too rapidly for a lagging exerctory system, all had contributed to periods of rearter or fesser mental abnormality.

That he was sane now, there was no question. But there were holes in

his memory that still had to be filled.

He began to talk, rapidly but carefully, telling the colonel all he knew about the situation up to the present.

It wasn't much. It was late October, 2091, and the Nipe, blithely evading capture for ten long years, was still going about his unknown and possibly incomprehensible business.

The Nipe had become a legend. He had replaced Satan, the Bogeyman, Frankenstein's monster, and Mumbo Jumbo, Lord of the Congo, in the public mind. He had taken on, in popular thought, the attributes of the dijinn, the vampire, the ghoul, the werewolf, and every other horror and hobgoblit that the mind of Man had conjured up in the previous half million years.

That he had been connected with the mysterious crash in Siberia ten years before was almost a certainty. How he had managed to get from there to Leningrad without being seen once was more of a mystery, but certainly not impossible in the light of what had been done since.

Eight months later, a non-vision phone call had been received by the Regent's Board of the Khrushchev Memorial Psychiatric Hospital in Leningrad. An odd, breathy voice offered (in very bad Russian!) a meeting. The Nipe had managed to explain, in spite of the language handicap, that he did not want to be mistaken for a wild animal, as had happened with the forest ranger.

The psychiatrists were divided in their opinions. Some thought that the call had been from a deranged person. When the Nipe actually showed up

at the appointed place, those minds changed rapidly.

The Nipe's ability to use any human language was limited. He picked up vocabulary and grammatical rules very rapidly, but he seemed completely unable to use a language beyond discussion of concrete actions and objects. His mind was simply too alien to enable him to do more than touch the edges of human communication.

In the discussion of mathematics, in particular, the Nipe seemed to be completely at a loss. He apparently thought of mathematics as a spoken language instead of a written one, and could not progress beyond simple

diagrams.

He wasn't captured in any real sense of the word. He refused to allow any physical tests on his body, and, short of threatening him at gun-point, there didn't seem to be any practicable way to force him to accede to the human's wishes. And they couldn't do that.

The Nipe had to be treated as an emissary from his home world, wherever that was. He'd killed a man, yes. But that had to be allowed as justifiable homicide in self-defense, since the forester had drawn a gun and was ready to fire. Nobody could blame the late Wang Kulichenko for that, but nobody

could blame the Nipe, either.

For six weeks the humans and the Nipe had tried to arrive at a meeting of minds, and just when it would seem within grasp, it would fade away into mist. It was nearly a month before the Russian psychologists and psychiatrists realized that the reason the Nipe had come to them was because he had thought that they were the ruling body of that territory!

The UN observers stayed out of it at first. Before there was any kind of talk on a Government level, there must be some kind of understanding on

a personal level. And that, of course, was never achieved.

Just what had set off the Nipe's anger hadn't been established yet, as far as Stanton knew. At a meeting one day, he had simply become more and more incomprehensible, and then, without any warning, he had leaped out, killed three of the men with his bare hands, and gone out the window.

And that had been the end of any diplomatic relations between humanity and the Nipe.

Since that time, he'd been on a rampage of robbery and murder. He was as callously indifferent to human life and property as a human being might be with the life and property of a cockroach.

There have been human criminals whose actions could be described in the same way, but the Nipe had a few touches that few human criminals would have thought of and almost none would have had the capacity to execute.

If, for instance, the Nipe had time to spare, his victims would be an annoying problem in identification when found, for there would be nothing left but well-mayed bones. And "time to spare," in this case meant twenty or thirty minutes. The Nipe had, if nothing else, a very efficient digestive tract. He ate like a shrew.

And the Nipe never, under any circumstances, used any weapon but the weapons Nature had given him—hands-or-feet, or claws or teeth. Never did he use a knife or gun or even a club.

Almost as an afterthought, one realized that the loot which the Nipe stole was seemingly unpredictable. Money, as such, he apparently had no use for not He had taken gold, silver, and platinum, but one raid for each of these elements had evidently been cough, except for silver, which had required three raids over a period of four years. Since then, he hadn't touched silver again.

He hadn't tried yet for any of the radioactives except radium. He'd taken a full ounce of that in five raids, but hadn't attempted to get his hands on uranium, thorium, plutonium, or any of the other elements normally associated with atomic energy. Nor had he tried to steal any of the fusion materials; the heavy isotopes of hydrogen or any of the lithium isotopes. Beryllium had been taken, but whether there was any significance in the thefts or not, no one knew.

There was a pattern in the thefts, nonetheless. They had begun small and increased. Scientific and technical instruments—oscilloscopes, X-ray generators, radar equipment, maser sets, dynostatic crystals, thermolight resonators, and so on—were stolen complete or gutted for various parts. After awhile, he went on to bigerer thines, whole aircraft, with their crews, had vanished,

That he had not committed anywhere near all the crimes that had been attributed to him was certain; that he had committed a great many of them was equally certain.

There was no doubt at all that his loot was being used to make instruments and devices of unknown kinds. He had used several of them on his raids. The one that could apparently phase out almost any electromagnetic frequency up to about a hundred thousand megacycles—including sixty-cycle power frequencies—was considered to be a particularly out item. So was the gadget that reduced the tensile strength of concrete to about that of a good grade of marshmallow.

After he had been operating for a few years, there was no installation on the face of the earth that could be considered Nipo-proof for more than a few minutes. He struck when and where he wanted and took whatever he needed.

It was manifestly impossible to guard against the Nipe, since no one knew what sort of loot might strike his fancy next, and there was therefore no way of knowing where or how he would hit next.

Nor could he ever be found after one of his raids. They were plotted and followed out with diabolical accuracy and thoroughness. He struck, looted, and vanished. And wasn't seen again until his next strike.

Colonel Mannheim, who had carefully puffed a cigar alight and smoked it thoughtfully during Stanton's recitation, dropped the remains of the cigar into an ash receptacle. "Accurate but incomplete," he said quietly. "You must have made some guesses." He looked from Bart Stanton to Dr. Farnsworth. "Yol like to hear them:

Farnsworth finished off the last of his coffee. "We've talked about it," he admitted. "Although I must say the hypothesis Bart has come up with

would never have occurred to me. I'm still not sure I credit it, but" . . . he shrugged . . . "I can't say that I disbelieve it, either."

Mannheim turned his eyes back to Stanton. His silence was a question.

"Logically, my theory mightn't hold much water," Stanton admitted. "But the evidence seems to be conclusive enough to me." He got up, went over to the coffee urn, and refilled his cup. "It seems incredible to me that the combined intelligence and organizational ability of the UN Government is incapable of finding anything out about one single alien, no matter how competent he may be," he said, as he returned to his seat.

"Somehow, somewhere, someone must have gotten a line on the Nipe. He must have a base for his operations, and someone should have found it

by this time.

"If there is such a base, then it must be possible to blast him out of it

without resorting to the kind of work it took to produce-me.

"I may be faster and more sensitive and stronger than the average man, but that doesn't mean that I have superhuman abilities to the extent that I can do in two or three years what the combined forces of the Government couldn't do in ten. Certainly you wouldn't rely too heavily on it.

"And yet, apparently, you are.

"To me that can only mean that you've got another ace up your sleeve. You know we're going to get the Nipe before I die. You either have a sure way of tracing him or else you already know where he is. "Which is it?"

Colonel Mannheim sighed. "We know where he is. We've known for six vears."

TV

INTERLUDE

The woman's eyes were filled with tears, for which the doctor was privately thankful. At least the original shock had worn off.

"And there's nothing we can do? Nothing?" There was a slight catch in

her voice.

"I'm afraid not. Not yet. There are research teams working on the problem, and one day . . . perhaps . . ." Then he shook his head. "But not yet." He paused. "I'm sorry, Mrs. Stanton."

The woman sat there on the comfortable chair and looked at the specialist's diploma that hung on the doctor's wall-and yet, she didn't really see the diploma at all. She was seeing something else-a kind of dream that had been shattered.

After a moment, she began to speak, her voice low and gentle, as though the dream was still going on and she were half afraid she might waken

herself if she spoke too loudly.

"Jim and I were so glad they were twins. Identical twin boys. He said-I remember, he said, 'We ought to call 'em Ike and Mike.' And he laughed a little when he said it, to show he didn't mean it.

"I remember, I was propped up in the bed, the afternoon they were born, and Jim had brought me a new bed jacket, and I said I didn't need a new one because I would be going home the next day, and he said: 'Hell, kid, you don't think I'd just buy a bed jacket just for hospital use, do you? This is for breakfasts in bed, too.'

"And that's when he said he'd seen the boys and said we ought to name them lke and Mike."

The tears were coming down Mrs. Stanton's cheeks heavily now, and grief made her look older than her twenty-four years, but the doctor said

nothing, letting her spill out her emotions in words.
"We'd talked about it before, you know—as soon as the obstetrician found
out that I was going to have twins. And Jim . . . Jim said that we shouldn't
name them alike unless they were identical twins or mirror twins. If they
were fraternal twins, we'd just name them as if they'd been ordinary brothers
or sisters or whatever. You know?" She looked at the doctor, pleading for

understanding.

"I know," he said.
"And Jim was always kidding. If they were girls, he said we ought to call them Flora and Dora, or Annie and Fanny, or maybe Susie and Floozie.
He was always kidding about it. You know?"

"I know," said the doctor.

"And then, when they were identical boys, he was very sensible about it.
"We'll call them Martin and Bartholomew," he said. 'Then if they want to
call themselves Mart and Bart, they can, but they won't be stuck with
rhyming names if they don't want them.' Jim was very thoughtful that way,
Dector. Very thoughtful.'

Doctor. Very thoughtful."

She suddenly seemed to realize that she was crying, and took a hand-

kerchief out of her sleeve to dab at her eyes and face.

"TII have to quit crying," she said, trying to sound brave and strong. "After all, it could have been worse, couldn't it? I mean, the radiation could have killed my boys, too. Jim's dead, yes, and I've got to get used to that. But I still have two boys to take care of, and the "Il need me."

"Yes, Mrs. Stanton, they will," said the doctor. "They'll both need you. And you'll have to be very gentle and very careful with both of them."

"How . . . how do you mean that?" she asked.

The doctor settled back in his chair and chose his words carefully. "Identical twins tend to identify with each other, Mrs. Stanton. There is a great deal of empathy between people who are not only of the same age, but genetically identical. If they were both healthy, there would be very little trouble in their education at home or at school. Any of the standard texts on psychodynamics in education will show you the pitfalls to avoid when dealing with identical siblings.

"But these boys are no longer identical. One is normal, healthy, and lively. The other is . . . well, as you have seen, he is slow, sluggish, and badly co-ordinated. That condition may improve with time, but, until we know more about such damage than we do now, he will be an invalid.

"That's the trouble with radiation damage, Mrs. Stanton. Even when we can save the victim's life, we cannot always save his health.

"You can see, I think, what sort of psychic disturbances this can bring about in such a pair. The ill boy tends to identify with the well one and,

unfortunately, the reverse is true. If they are not properly handled during their formative years, Mrs. Stanton, both can be badly damaged emotionally.

"I . . . I think I understand," the woman said. "But what sort of thing

should I look out for?"

"I suggest that you get a good man in psychic development," the doctor said. "I'd hesitate to prescribe. It's out of my field. But, in general, most of your trouble will be caused by a tendency for the pair to swing into one of two extremes.

"Mutual antagonism can arise if one becomes jealous of the other's health, while the healthy one becomes jealous of the extra consideration shown his

crippled brother.

Or, on the other hand, the healthy boy may identify so closely with his brother that he feels every hurt or slight, real or imagined. He becomes over-solicitous, over-protective. At the same time, the other brother may

come to depend completely on the healthy twin.

"In both these situations, there is a positive feedback which constantly worsens the situation. It requires a great deal of careful observation and careful application of the proper educational stimuli to keep the situation from developing toward either extreme. You'll need expert help, if you want both boys to display the full abilities of which they are potentially capable." "I see, Could you give me the name of a good man, Doctor?"

The doctor nodded and picked up a book on his desk. "I'll give you several names. You can pick the one you like. They're all good men. There are many good women in the field, too, but in this case. I think a man would be best. Of course, if one of them thinks a woman is indicated,

that's up to him. As I said, that isn't my field."

He opened the small book and riffled through it to find the names he wanted.

The image of the Nipe on the glowing screen was clear and finely detailed. It was, Bart thought, as though one were looking through a window into the Nipe's nest itself. Only the tremendous depth of focus of the lens which caught the picture gave the illusion a sense of unreality. Everything-background and foreground alike-was sharply in focus.

The Nipe moved in slow motion, giving the watchers the eerie feeling that he was moving through a thicker, heavier medium than air, in a place where

the gravity was much less than that of Earth. "Speed the tape up to normal," said Colonel Mannheim to the man who was operating the machine. "If there's anything Mr. Stanton wants to look

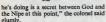
at more closely, we can run it through again.'

As if in obedience to the colonel's command, the Nipe seemed to shake himself a little and go about his business more briskly, and the air and gravity seemed to revert to those of Earth.

"What's he doing?" Stanton asked. The Nipe was doing something with an odd-looking box that sat on the floor in front of him.

"He's got a screwdriver that he's modified to give it a head with an L-shaped cross-section, and he's wiggling it around inside that hole in the box. But what





Stanton glanced away from the screen for a moment to look at the other men who were there. Some of them were watching the screen, but most of them seemed to be watching Stanton, although they looked away as soon as they saw his eyes on them.

Trying to see what kind of a bloke this touted superman is, Stanton thought. Well, I can't say I blame 'em.

He brought his attention back to the screen.

So this was the Nipe's hideaway. He wondered if it were furnished in the fashion! that a Nipe's living quarters would be furnished on whatever planet the multilegged horror called home. Probably it had the same similarity as Robinson Crusoe's island home had to a middle-class Nineteenth § Century English home.

There was no furniture at all, as such. Low-slung as he was, the Nipe needed

no tables for his work, and sleeping was a form of metabolic rest that he evidently found unnecessary, although he would sometimes just remain quiet for periods of time ranging from a few minutes to a couple of hours.

"We had a hard time getting the first cameras in there," the colonel was saying, "That's why we missed some of the early stages of his work. There! Look at that!"

"That attachment he's making?"

"That's right. Now, it looks as though it's a meter of some kind, but we

don't know whether it's a test instrument or an integral part of the machine he's making. The whole thing might be a test instrument. After all, he had to start out from the very beginning—making the tools to make the tools to make the tools, you know."

"It's not quite as bad as all that," said one of the other men, who had been briefly introduced to Stanton as Fred Meyer. "After all, he had our technology to draw upon. If he'd been wrecked on Earth two or three centuries are, he

wouldn't have been able to do a thing."

"Granted," the colonel said agreeably, "but it's quite obvious that there are parts of our technology that are just as alien to him as parts of his are to us. Remember how he went to all the trouble of building a pentode vacuum tube for a job that could have been done by transistors. His knowledge of solid-state physics seems to be about a century and a half behind ours."

"Not completely, Colonel" Meyer said. "That gimmick he built last year the one that blinded those people in Bagdad—had five perfect emeralds in it,

connected in series with silver wire."

"That's true. Our technologies seem to overlap in some areas, but in others there's total alienness."

"Which one would you say was ahead of the other?" Stanton asked.
"Hard to say," said Colonel Mannheim, "but I'd put my money on his
technology as encompassing more than ours—at least insofar as the physical

sciences are concerned."
"I agree," said Meyer, "he's got things in that little nest of his that—" He

stopped and shook his head slowly, as though he couldn't find words.
"I'll say this," Bart Stanton said musingly, "our friend, the Nipe, has plenty
of guts. And patience," He smiled a little and then amended his statement.

"From our own point of view, that is."

Colonel Mannheim's face took on a quizzical expression. "How do you mean? I was about to agree with you until you tacked that last phrase on.

What does point of view have to do with it?"
"Everything, I should say," Stanton said. "It all depends on the equipment an individual has. A man who rushes into a burning building to save a life, wearing nothing but street clothes, has courage. A man who does the same thing when he's wearing a nullotherm suit is an unknown quantity. There is

no way of knowing, from that action alone, whether he has courage or not."

Meyer looked a little dazed. "Pardon me if I seem thick, Mr. Stanton, but

. . . Are you saying that the Nipe's technological equipment is better than ours?"

"Not at all. I'm talking about his personal equipment." He turned again to the colonel. "Colonel Mannheim, do you think it would require any personal courage on my part to stand up against you in a face-to-face gunfight?"

The colonel grinned tightly. As see what you mean. No, it wouldn't."

"On the other hand, if you were to challenge me," Bart Stanton continued,
"would that show courage?"

"Not really, Foolhardiness, stupidity, or insanity—not courage."

"Then neither of us can prove we have guts enough to fight the other. Can we?"

Colonel Mannheim smiled grimly and said nothing, but Meyer, who evidently had a great deal of respect for the colonel, said: "Now, wait a

second! That depends on the circumstances! If Colonel Mannheim, say, knew that forcing you to shoot him would save someone else's life-some-

one more important, say, or maybe a lot of people, then-" Colonel Mannheim laughed. "Meyer, you've just proved Mr. Stanton's

point!"

Meyer gaped for a half second, then burst into laughter himself. "Pardon

my point of view, Mr. Stanton! I guess I am a little slow!"

Mannheim said: "Precisely! Whether the Nipe has courage or patience or any other human feeling depends on his own abilities and on how much information he has. A man can perform any action without fear if he knows that it will not hurt him—or if he does not know that it will." He glanced at the screen. The Nipe had settled down into his "sleeping position"—unmoving, although his baleful violet eyes were still open. "Cut that off, Meyer," the colonel said. "There's not much to learn from the rest of that tape."

"Have you actually managed to build any of the devices he's constructed?"

Stanton asked.

than I can.'

"Some," said Colonel Mannheim, "We have specialists all over the world studying the tapes. We have the advantage of being able to watch every step the Nipe makes, and we know the materials he's using to work with. But, even so, the scientists are baffled by many of them. Can you imagine the time James Clerk Maxwell would have had trying to build a modern television set from tapes like this?"

"I know exactly how he'd feel," Meyer said glumly.

"You can see, then, why we're depending on you," Mannheim told Stanton. Stanton merely nodded. The knowledge that he was actually a focal point

in human history, that the whole future of the human race depended to a tremendous extent on him, was a realization that weighed heavily, and, at the same time, was immensely bracing, ment. They'll be able to give you a great deal more information on the Nipe

"And now," the colonel said, "I'll turn you over to the psychology depart-

The Nipe squatted, brooding, in his underground nest, waiting for the special crystallization process to take place in the sodium-gold alloy that was forming in the reactor.

How long? he wondered. He was not thinking of the crystallization reaction; he knew the timing of that to the fraction of a second. His dark thoughts were

focused inwardly, upon himself.

How long would it be before he would be able to construct the communicator that would put him in touch with his own race again? How long before he could discourse again with reasonable beings? For how much longer would he be stranded on an insane planet, surrounded by degraded, insane beings?

The work was going incredibly slowly. He had known at the beginning that his knowledge of the basic arts required to build a communicator was incomplete, but he had not realized just how painfully inadequate it was. Time after time, his instruments had simply refused to function because of some basic flaw in their manufacture-some flaw that an expert in that field could have pointed out at once. Time after time, equipment had had to be rebuilt almost from the beginning. And, time after time, only cut-and-dry methods were available for correcting his errors.

Not even his prodigious and accurate memory could hold all the information that was necessary for the work, and there were no reference tapes

available, of course.

He had long since given up any attempt to understand the functioning of the mad pseudo-civilization that surrounded him. He was quite certain that the beings he had seen could not possibly be the real rulers of this society, but he had, as yet, no inkling as to who the real rulers were.

As to where they were, that question seemed a little easier to answer. It was highly probable that they were out in space, on the sateroids that his instruments had detected as be had dropped in toward this planet so many years before. He had made an error back then in not landing in the Belt, but at no time since had be experienced the emotion of regret or wished he had done differently; both thoughts would have been incomprehensible to the Nipe. He had made an error; the circumstances had been checked and noted: he would not make that error seain.

What further action could be taken by a logical mind?

None. The past was unchangeable. It existed only as a memory in his own mind, and there was no way to change that indelible record, even had he

wished to do such an insane thing.

Surely, he thought, the real rulers must know of his existence. He had tried, by his every action, to show that he was a reasoning, intelligent, and

civilized being. Why had they taken no action?

His hypotheses, he realized, were weak because of lack of data. He could

only wait for more information.
That—and continue to work.

VII

INTERLUDE

Mrs. Frobisher touched the control button that depolarized the window n the breakfast room, letting the morning sun stream in. Then she said, in a low voice, "Larry, come here."

Larry Frobisher looked up from his morning coffee. "What is it, hon?"

"The Stanton boys. Come look."

Frobisher sighed. "Who are the Stanton boys, and why should I come look?" But he got up and came over to the window.

"See—over there on the walkway toward the play area," she said.
"I see three girls and a boy pushing a wheeled contraption," Frobisher said. "Or do you mean that the Stanford boys are dressed up as girls?"

"Stanton," she corrected him. "They just moved into the apartment on the first floor."

"Who? The three girls?"

"No, silly! The two Stanton boys and their mother. One of them is in that 'wheeled contraption'. It's called a therapeutic chair."

"Oh? So the poor kid's been hurt. What's so interesting about that, aside

from morbid curiosity?"

The boy pushing the chair went around a bend in the walkway, out of sight, and Frobisher went back to his coffee while his wife spoke.

"Their names are Mart and Bart. They're twins."

"I should think," Frobisher said, applying himself to his breakfast, "that the mother would get a self-powered chair for the boy instead of making

the other boy push it."

"The poor boy can't control the chair, dear. Something wrong with his nervous system. I understand that he was exposed to some kind of radiation when he was only two years old. That's why the chair has all the instruments built into it. Even his heartbeat has to be controlled electronically."

"Shame." Frobisher speared a bit of sausage. "Kind of rough on both of

'em. I'd guess."

"How do you mean?"

"Well, I mean, like . . . Well, for instance, why are they going over to the play area? Play games, right? The one that's well has to push his brother over there-can't just get out and go; has to take the brother along, Kind of a burden, see?

"And then, the kid in the chair has to sit there and watch his brother play baseball or iai alai, while he can't do anything himself. Like I say, kind of

rough on both of them."

Yes, I suppose it must be. More coffee?"

"Thanks, honey, And another slice of toast, hunh?"

The two objects floating in space both looked like pitted pieces of rock. The larger one, roughly pear-shaped and about a quarter of a mile in its greatest dimension, was actually that-a hunk of rock. The smaller-much smaller-of the two was a camouflaged spaceboat. The smaller was on a near-collision course with reference to the larger, although their relative velocities were not great.

At precisely the right time, the smaller drifted by the larger, only a few hundred yards away. The weakness of the gravitational fields generated between the two caused only a slight change of orbit on the part of both

bodies. Then they began to separate. But, during the few seconds of their closest approach, a third body had detached itself from the camouflaged spaceboat and shot rapidly across the

intervening distance to land on the surface of the floating mountain. The third body was a man in a spacesuit. As soon as he landed, he sat down, stock-still, and checked the instrument case he held in his hands.

No response. Thus far, then, he had succeeded.

He had had to pick his time precisely. The people who were already on this small planetoid could not use their detection equipment while the planetoid itself was within detection range of Beacon 971, only two hundred and eighty miles away. Not if they wanted to keep from being found. Radar pulses emanating from a presumably lifeless planetoid would be a dead giveaway.

Other than that, they were mathematically safe-if they depended on the laws of chance. No ship moving through the Asteroid Belt would dare to move at any decent velocity without using radar, so the people on this



needs a range of three hundred miles. The man who called himself Stanley Martin had

carefully plotted the orbit of this particular planetoid and then let his spaceboat coast in without using any detection equipment except the visual. It had been necessary, but

very risky. Had the people here seen his boat? If so, had they recognized it, in spite of the heavy camouflage? And, even if they only suspected, what would be their reaction?

He waited.

It takes nerves and patience to wait for thirteen solid hours without moving more than an occasional flexure of muscles, but he managed that long before the instrument case waggled a meter needle at him. The one relieving factor was the low gravity; on an asteroid, the problem of sleeping on a bed of nails is caused by the likelihood of accidentally throwing oneself off the bed. The probability of puncture or discomfort from the points is almost negligible.

When the needle on the instrument panel flickered, he got to his feet and began moving. He was almost certain that he had not been detected.

Walking was out of the question. This was a silicate-alumina rock, not a nickel-iron one. The group that occupied it had deliberately chosen it that way, so that there would be no chance of its being picked out for slicing by one of the mining teams in the Asteroid Belt, Granted, the chance of any given metallic planetoid's being selected were very small, they had not even wanted to take that chance. Therefore, without any magnetic field to hold him down, and only a very tiny gravitic field, the man had to use different tactics.

It was more like mountain climbing than anything else, except that there was no danger of falling. He crawled over the surface in the same way that an Alpine climber might crawl up the side of a steep slope—secking band-holds and technolds and using them to propel himself ownard. The only difference was that he covered distance a great deal more rapidly than a mountain climber could.

When he reached the spot he wanted, he carefully concealed himself beneath a craggy overhang. It took a little searching to find exactly the

right spot, but when he did, he settled himself into place in a small pit and began more elaborate preparations.

Self-hypnosis required nearly ten minutes. The first five or ix minutes were taken up in relaxing from his exertion. Gravity notwithstanding, he had had to push his hundred and eighty pounds of mass over a considerable distance. When he was completely relaxed and completely hypnotized, he reached up and cut down the valve that fed oxygen into his suit.

pletely relaxed and completely hypnotized, he reached up and cut down the valve that fed oxygen into his smit.

Then, of his own will, he went cataleptic.

A single note, sounded by the instruments in the case by his side, woke

him instantly. He came fully awake, as he had commanded himself to do.

Immediately, he turned up his oxygen intake, at the same time glancing

at the clock dial in his helmet. He smiled. Nineteen days and seven hours. He had calculated it almost precisely. He wasn't more than an hour off, which was pretty good, all things considered.

He consulted his instruments again. The supply ship was ten minutes away.

The smile stayed on his face as he prepared for further action.

The first two minutes were conscientiously spent in inhaling oxygen. Even under the best cataleptic conditions, the body tended to slow down too much.

He had to get himself prepared for violent movement.

Eight minutes left. He climbed out of the little grotto where he had concealed himself and moved toward the spot where he knew the air lock to the caverns underneath the planetoid's surface was hidden. Then, again, he concealed himself and waited, while he continued to breathe deeply of the highly oxygenated air in his suit. Five minutes before the ship landed, he swallowed eight ounces of the nutrient solution from the tank in the back of his helmet. The solution of amino acids, vitamins, and honey sugar also contained a small amount of stimulant of the dexedrine type and one per cent ethano. Then he unholstered his gun.

It wasn't a big ship. He had known it wouldn't be. It was only a little larger than the one he had used to come here. It dropped down to the surface of the small planetoid only ten meters from the hidden trapdoor

that led to the air lock beneath the surface.

He could suddenly hear voices in the earphones of his helmet.

Lasser?

It's me, Fritz. I got your supplies and good news.

The air lock trapdoor opened, and a spacesuited figure came out. How about the deal?

That's the good news, said the second suited figure as it came from the

air lock of the grounded spaceboat. Another five million.

The man who was hidden behind the nearby crag of rock listened and watched for a minute or so more while the two men began unloading cases of foodstuffs from the spaceboat. Then, satisfied that it was perfectly safe, be aimed his gun and shot twice in rapid succession. The range was almost point-blank, and there was, of course, no need to take either gravity or air resistance into account.

The pellets of the shotgun-like charge that blasted out from the gun were small, needle-ahaped, and heavy. They were oriented point-forward by the magnetic field along the barrel of the weapon. Of the hundreds in each charge fired, only a few penetrated the spacesuits of the targets, but those few were enough. The powerful drug in the needle-pointed head of each went into the bloodstream of the target.

Each man felt an itching sensation. He had less than two seconds to think about it before unconsciousness overtook him and he slumped nervelessly.

The man with the gun ran across the intervening space quickly, his body only a few degrees from the horizontal, and his toes paddling rapidly to propel him over the rough rock.

He braked himself to a halt and slapped air patches over the area where his charges had struck the men's suits, sealing the tiny air leaks, and, at the same time, driving more of the tiny needles into their skins. They would be out for a long time.

Neither of them had yet fallen to the ground; that would take several

minutes under this low gravity. He left them to drop and headed toward the open air lock.

This was what he had been waiting for all those nineteen days in cataleptic hypnosis. He couldn't have cut his way in from the outside; he had had to wait until it was opened, and that time would come only when the supply ship came.

Once in the air lock, he touched the control stud that would close the outer door, pump air into the waiting room, and open the inner door. Here was his greatest point of danger-greater, even, than the danger of coming to the planetoid, or the danger of waiting nineteen days for the coming of the supply ship. If the ones who remained within suspected anything-anything at all!-then his chances of coming out of this alive were practically nil.

But there was no reason why they should suspect. They should think that the man coming in was one of their own. The radio contact between the men outside had been limited to a few millimicrowatts of power-necessarily. since radio waves of very small wattage can be decoded at tremendous distances in open space. The men inside the planetoid certainly should not have been able to pick up any more than the beginning of the conversation, before it had been cut off by solid rock. It was a high-speed air lock. Unlike the soundless discharge of his special

gun in the outer airlessness, the blast of air that came into the waiting chamber was like a hurricane in noise and force, as the room filled in a few seconds

He held onto the handholds tightly while the brief but violent winds buffeted him. He turned as the inner door opened.

His eyes took in the picture in a fraction of a second. In an even smaller fraction, his mind assimilated the picture,

The woman was dark-haired, dark-eyed, and muscular. Her mouth was wide and thick-lipped beneath a large nose.

The man was leaner and lighter, bony-faced and beady-eyed. The woman said: "Fritz, what-"

And then he shot them both with gun number two.

No needle charges this time; such shots would have blown them both in two, unprotected as they were by spacesuits. The small handgun merely iangled their nerves with a high-powered blast of accurately beamed supersonics. While they were still twitching, he went over and jabbed them with a drug needle.

Then he went on into the hideout.

He had to knock out one more man, whom he found sound asleep in a room off the short corridor.

It took a gas bomb to get the two women who were guarding the kid. He made sure that the BenChaim boy was all right, then he went to the little communications room and called for help.

Colonel Walther Mannheim tapped the map that glowed on the wall before him, "He's right there, where those tunnels come together."

Bart Stanton looked at the map of Manhattan Island and at the gleaming

colored traceries that threaded their various ways across it. "Just what was the purposes of those tunnels?" he asked curiously.

"They were for rail transportation," said the colonel. "The island was hit by a sun bomb during the Holocaust, and almost completely leveled and slagged down. When the city was rebuilt, there was naturally no need for such things, so they were simply sealed off and forgotten."

"Right under Government City,"

Stanton said. "Incredible."

"It used to be one of the largest seaports in the world," Colonel Mannheim said, "and it probably still would be if the inertia drive hadn't made air travel cheaper and easier than seagoing." "How did he find out about the

tunnels?" Stanton asked.

The colonel pointed at the north end of the island, "After the Holocaust, the first returnees to the island were wild animals which crossed from the mainland from the north. The Harlem River isn't very wide at this point. Also, because of the rocky hills at this end of the island, there were places which were spared the direct effects of the bomb, and grasses and trees began growing there. That's why it was decided to leave that section as a game preserve when the Government built the capital on the southern part of the island." His finger moved down the map. "The upper three miles of the island, down to here, where it begins to widen, are all game preserve. There's a high wall here which separates it from the city, and the ruins of the bridges which connected with the mainland have been removed, so the animals can't get back across any more.

"Two years after he arrived, the Nipe was almost caught. He had manged, somehow—we're not sure yet exactly how—to get here from Asia. According to the psychologists who have been studying him, he apparently does not believe that human beings are any more





than trained animals; he was looking hen—as he is apparently still looking—for the 'real' rulers of Earth. He expected to find them, of course, in Government City. Needless to say," said the colonel with a touch of irony, "he failed."

"But he was seen?" asked Stanton.

"He was seen. And pursued. But he got away easily, heading north. The island was searched, and the police were ready to start an inch-by-inch going over of the island two days later. But the Nipe hit and robbed a chemical supply house in northern Pennsylvania, killing two men, so the search was called off.

"It wasn't until two years later, after chaustive analysis of the pattern of his raids had given us something to work with, that we decided that he must have found an opening into one of the tunnels up here in the game preserve." He gestured again at the map. "If wouldn't take him long to see that no human being had been down there in a long time. It was a perfect place for his base."
"How does he move in and out?"

Stanton asked.

"This way." The colonel traced a finger down one of the red lines on the map, southward, until he came to a spot only a little over two miles from the southernmost tip of the island. The line turned abruptly toward the western edge of the island. where it stopped.

"This tunnel goes underneath the Hudson River at this point, and emerges on the other side. It's only one of several that do so. They're all flooded now; the sun bomb caved them in when the primary shock wave hit the surface of the river.

"In spite of his high rate of metabolism, the Nipe can store a tremendous amount of oxygen in his body, and can stay under water for as long as half an hour without breathing apparatus—if he conserves his energy. When he's wearing his scuba apparatus; he's practically a

self-contained submarine. The pressure doesn't seem to bother him much. He's a tough cookie."

Stanton noded silently and slowly. Could he beat the Nipe in hand-tohand combat? There would be no way of knowing until the final moment of success or failure.

"At that time," the colonel went on, "we hadn't formulated any definite policy on the Nipe. We didn't know what he was up to; we weren't even sure he was actually down in those tunnels. We had to find out."

He walked over to the nearby table and opened a box some twelve inches long and five-by-five inches in cross section.

"See this?" he said as he took something out.

It looked like a large dead rat.

"Our spy," said Colonel Mannheim.

The rat moved along the rusted steel rail that ran the length of the huge tunnel. To a human being, the tunnel would have seemed to be in utter darkness, but the little eyes of the rat saw its surroundings as faintly luminescent, glowing from the infra-red radiations given out by the internal warmth of cement and steel. The main source came from above, where the heat of the sun and of the energy sources in the buildings on the surface seeped through the roof of the tunnel.

On and on it moved, its little pinkish feet pattering almost silently on the oxidized metal surface of the rail. Its sensitive ears picked up the movements and the squeals of other rats, but it paid them no heed. Several times, it met other rats on the rail, but most of them sensed the alienness of this rat and scuttled out of its way.

Once, it met a rat who did not give way. Hungry, perhaps, or perhaps merely yielding to the paranoid fury that was a normal component of the rattish mind, it squealed its defiance to the rat that was not a rat. It advanced, barrine its teeth.

The rat that was not a rat became suddenly motionless, its sharp rodent's nose pointed directly at the enemy. There came a noise, a timy popping hiss, like that of a very small drop of water striking hot metal. From the left nostril of the not-rat, a tiny glasslike needle snapped out at bullet speed. It struck the advancing rat in the center of the pink tongue that was visible in the open mouth. Then the not-rat scuttled backwards faster than any rat could have moved.

For a second, the real rat hesitated, and it may be that the realization penetrated into its dim brain that rats did not fight this way. Then, as the tiny needle dissolved in its bloodstream, it closed its eyes and collapsed, rolling limply off the rail.

The rat might come to before it was found and devoured by its fellowsor it might not. The not-rat moved on, not caring either way. The human intelligence that looked out from the eyes of the not-rat was only concerned with getting to the Nipe.

"That's how we found the Nipe," Colonel Mannheim said, "and that's how we keep tabs on him now. We have over seven hundred of these remote-controlled robots hidden in strategic spots in those tunnels now, but it took

time to get everything set up this way. Now, we can follow the Nipe wherever he goes, so long as he stays in the tunnels. If he went out through an open air exit, we could have him followed by bird-robots but—" He shrugged wryly. "I'm afraid the underwater problem still has us stumped. We can't get the carrier wave for the remote-control impulses to go far underwater."

"How do you get your carrier wave underground to those tunnels?" Stanton asked.

The colonel grinned widely. "One of the boys dreamed up a real cute gimmick. The rails themselves act as antenna for the broadcaster, and the rai's tail is the pickup antenna. As long as the rat is crawling right on the rail, only a microscopic amount of power is needed for control, not enough for the Nipe to pick up with his instruments. Each rat carries its own battery for motive power, and there are old copper power cables down there that we can send direct current through to recharge the batteries. And, when we need them, the copper cables can be used as antennas. It took us quite a while to work the system out."

Stanton rubbed his head thoughtfully. Damn these gaps in my memory! he thought. It was sometimes embarrassing to ask questions that any schoolboy

"Aren't there ways of detecting objects underwater?" he asked after a moment.

"Yes," said the colonel, "But they all require beamed energy of some kind to be reflected from the object, and we don't dare use anything like that." He sat down on one corner of the table, his bright blue eyes looking up at Stanton.

"That's been our problem all along," he said seriously. "Keeping the Nipe from knowing that he's being watched. In the tunnels, we've used only equipment that was already there, adding only what we absolutely had to—amall things, a few strands of wire, a tiny relay, things that can be hidden in out of the way places. After all, he has his own alarm system in that maze of tunnels, and we've deliberately kept away from his detecting devices. He knows about the rats and ignores them; they're part of the environment. But we don't dare use anything that would tip him off to our knowledge of his whereabouts. One slip like that, and hundreds of human beings will have died in vain."

"And if he stays there too long," Stanton said levelly, "millions more may die."

The colonel's face was grim as he looked directly into Stanton's eyes. "That's why you have to know your job down to the most minute detail when the time comes to act. The whole success of the plan will depend on you and you alone."

Stanton's eyes didn't avoid the colonel's. That's not true, he thought. I'll only be one man on a team, and you know it, Colonel Mambeim. But you'd like to shove all the responsibility off onto someone else—someone stronger. You've finally met someone that you consider superior in that way, and you want to unload. I wish I felt aconfident as you do, but I doll.

Aloud, he said: "Sure. Nothing to it. All I have to do is take into account everything that's known about the Nipe and make allowances for everything that's not known." Then he smiled. "Not," he added, "that I can think of any other way to go about it."

x

St. Louis hadn't been hit during the Holocaust; it still retained much of the old-fashioned flavor of the Nineteenth and Twentieth Centuries, especially in the residential districts. Bart Stanton liked to walk along those quiet streets of an evening, just to let the peacefulness seep into him. And, knowing it was rather childish, he still enjoyed the small pleasure of playing hookey from the Nourophysics institute. Technically, he supposed, he was still a patient there. More, now that he had accepted Colonel Mannheim's assignment, he was presumably under military discipline. But he assumed that, if he had asked permission to leave the Institute's grounds, he would have been given that permission without question.

But, like playing hookey, or stealing watermelon, it was more fun if it was done on the sky. The boy who comes home feeling deliciously whicked and delightfully simula after staying away from school all day can have his whole day ruined by being told that it was a holiday and that the school had been closed. Bart Stanton didn't want to spoil his own fun by asking for permission to leave the grounds when it was so easy for a man with his special abilities.

to get out without asking.

Besides, there was a chance—a small one, he thought—that permission might be relixed for one reason or another, and Bart was fully aware that he would not disobey a direct request—to say nothing of a direct order—that he stay within the walls of the Institute. He didn't want to run any risk of losing his freedom, small though it was. After five years of mental and physical hell, he felt a need to get out into the world of normal, everyday recopie.

His legs moved smoothly, surely, and unhurriedly, carrying him aimlessly along the resilient walkway, under the warm glow of the street lights. The people around him walked as casually and with seemingly as little purpose as he did. There was none of the brisk sense of urgency that he felt inside the

walls of the Institute.

He knew he could never get away from that sense of urgency completely, even out here. There were times when it seemed that all he had ever done, all his life, was to train himself for the single purpose of besting the Nipe.

If he wasn't training physically, he was listening to lectures from the psychologists or from Colonel Mannheim—laying plans and considering possibilities for the one great goal that seemed to be the focal point of his whole life

What would happen if he failed? He would die, of course, and Mannheim's Plan Beta would immediately go into effect. The Nipe would be killed eventually.

But what if he, Stanton, won? Then what?

The people around him were not a part of his world, really. Their thoughts, their motions, their reactions, were slow and clumsy in comparison with his own. Once the Nipe had been conquered, what purpose would there be in the life of Bartholomew Stanton? He was surrounded by people, but he was not one of them. He was immersed in a society that was not his own because it was not, could not be, geared to his abilities and potentials. But there was no other society to turn to, either.

He was not a man "alone, afraid" in a world he had never made; he was a man who had been made for a world, a society, that did not exist. Women? A wife? A family life?

Where? With whom?

where i with whom:

He pushed the thoughts from his mind, the questions unanswered and perhaps unanswerable. In spite of the apparent bleakness of the future, he had no desire to die, and there was the possibility that too much brooding of that kind would evoke a subconscious reaction that could slow him down or cause a wrong decision at a vital moment. A feeling of futility could operate to bring on his death in spite of his conscious determination to win the coming battle with the Nipe.

The Nipe was his first duty. When that job was finished, he would consider the problem of himself. Just because he could not now see the answer to

that problem did not mean that no answer existed.

He suddenly realized that he was hungry. He had been walking through Memorial Park, past the museum, an old, worn edifice that was still called the Missouri Pacific Building. There was a small restaurant only a block away. He reached into his pocket and took out the few coins that were there. Not much, but enough to buy a sandwich and a glass of milk. Because of the trust fund that had been set up when he had started the treatment at the Neurophysics Institute, he was already well off, but he didn't have much cash. What good was cash in the Institute, where everything was provided?

He stopped at a newsvendor, dropped in a coin, and waited for the reproducing mechanism to turn out a fresh paper. Then he took the folded

sheets and went onto the restaurant.

He rarely read a newsheet. Mostly, his information about the world that exist drustide the walls of the Institute came from the televised newscasts. But, occasionally, he liked to read the small, relatively unimportant little stories about people who had done small, relatively unimportant things—stories that didn't aponer in the headlines or on the newscast.

The last important news story had come two nights before, when the Nipe had robbed an optical products company in Miami. The camera had shown the shop on the screen. Whatever had been used to blow open the door of the vault had been more effective than necessary. It had taken the whole front door of the shop and both windows, too. The bent and twisted paraglass that had lain on the pavement showed how much force had been applied from within.

And yet, the results were not that of an explosion. It was more as though some tremendous force had pushed outward from within. It had not been the shattering shock of high explosive, but some great thrust that had

unhurriedly, but irresistibly, moved everything out of its way.

Nothing had been moved very far, as it would have been by a blast. It appeared that everything had simply fallen aside, as though scattered by a giant hand. The main braces of the store front were still there, bent outward a little, but not broken.

The vault door had lain on the floor of the shop, only a few feet from the front door. The vault itself had been farther back, and the camera had showed it, standing wide open, gaping. Inside, there had been pieces of fragile glass standing on the shelves, unmoved, unharmed.

The force, whatever it had been, had moved in one direction only, from a point within the vault, just a few feet from the door, pushing outward to tear out the heavy door as though it had been made of parafin or modeling clay.

Stanton had recognized the vault construction type: the Voisier construction, which, by test, could withstand almost everything known, outside of the actual application of atomic energy itself. In a widely-publicized demonstration several years before, a Voisier vault had been cut open by a team of well-trained, well-equipped technicians. It had taken twenty-one hours for them to breach the wall, and they had had no fear of interruption, or of making a noise, or of setting off the intricate alarms that were built into the safe itself. Not even a borazon drill could make much of an impression on a metal which had been formed under millions of atmospheres of pressure.

And yet the Nipe had taken that door out in a second, without much effort at all.

The crowd that had gathered at the scene of the crime had not been large. The very thought of the Nipe kept people away from places where he was known to have been. The specter of the Nipe evoked a fear, a primitive fear —fear of the dark and fear of the unknown, combined with the rational fear of a very real, very tangible danger.

And yet, there had been a crowd of onlookers. In spite of their fear, it is hard to keep human beings from being curious. It was known that the Nipe didn't stay around after he had struck, and, besides, the area was now full of armed men. So the curious came to look and to stare in revulsion at the neat pile of gnawed and bloody bones that had been the night watchman, carefully killed and eaten by the Nipe before he had opened the vault.

Thus curiosity does make fools of us all, and the native hue of caution is crimsoned o'er by the bright red of morbid fascination.

Stanton went through the door of the automat restaurant and walked over to the vending wall. The dining room was only about three-quarters full of people; there were plenty of seats available. He fed coins into the proper slots, took his sandwich and milk over to a seat in one corner and made himself comfortable.

He flipped open the newspaper and looked at the front page.

And, for a moment, his brain seemed to freeze.

The story itself was straightforward enough:

BENCHAIM KIDNAPPERS NABBED! STAN MARTIN DOES IT AGAIN!

Ceres, June 3 (Interplanetary News Service)—The three men and three women who allegedly kidnapped ten-year-old Shmuel BenChaim were brought to justice today through the single-handed efforts of Stanley Martin, famed investigator for Lloyd's of London. The boy, held prisoner for more than ten months on a small asteroid, was reported in very good health.

According to Lt. John Vale, of the Planetoid Police, the kidnap gang could not have been taken by direct assault on their hideout because of fear that the boy might be killed. "The operation required a carefullyplanned, one-man infiltration of their hideout," he said. "Mr. Martin was the man for the iob."

Labeled "the most outrageous kidnapping in history," the affair was conceived as a long-term method of gaining control of Heavy Metals Incorporated, controlled by Moishe BenChaim, the boy's father. The details

But Bart Stanton wasn't interested in the details. After only a glance through the first part of the article, his eyes returned to the picture alongside the article. The line of print beneath it identified the man in the picture as Stanley Martin.

But a voice in Bart Stanton's brain said: Not Stan Martin! The name is Mart Stanton!

And Bartholomew felt a roar of confusion in his mind, because he didn't know who Mart Stanton was, and because the face in the picture was his own.

TO BE CONCLUDED



page 47 offers you an invitation



logical step

ORDINARILY, THE MILITARY
LEAST WANTS TO HAVE
THE OTHERS KNOW THE
FINAL DETAILS OF THEIR
WAR PLANS, BUT, LOGICALLY, THERE WOULD BE
TIMES.

Ben Boya

[&]quot;I DON'T really see where this problem has anything to do with me,"
I could be doing."

Ford, the physicist, glanced at General LeRoy. The general had that

quizzical expression on his face, the look that meant he was about to do something decisive.

"Would you like to see the problem first-hand?" the general asked, innocently.

The CIA man took a quick look at his wristwatch. "O.K., if it doesn't take too long. It's late enough already."

"It won't take very long, will it, Ford?" the general said, getting out of his chair.

"Not very long," Ford agreed. "Only a lifetime."

The CIA man grunted as they went to the doorway and left the general's office. Going down the dark, deserted hallway, their footsteps echoed hollowly.

"I can't overemphasize the seriousness of the problem," General LeRoy said to the CIA man. "Eight ranking members of the General Staff have either resigned their commissions or gone straight to the violent ward after just one session with the computer."

The CIA man scowled. "Is this area Secure?"

General LeRoy's face turned red. "This entire building is as Secure as any edifice in the Free World, mister. And it's empty. We're the only living people inside here at this hour. I'm not taking any chances."

"Just want to be sure."

"Perhaps if I explain the computer a little more," Ford said, changing the subject. "vou'll know what to expect."

"Good idea," said the man from CIA.

"We told you that this is the most modern, most complex and delicate computer in the world . . . nothing like it has ever been attempted before anywhere."

"I know that. They don't have anything like it," the CIA man agreed.
"And you also know, I suppose, that it was built to simulate actual war situations. We fight wars in this computer . . . wars with missiles and bombs and gas. Real wars, complete down to the tiniest detail. The computer tells us what will actually happen to every missile, every city, every man . . . who dies, how many planes are lost, how many trucks will fail to start on a cold morning, whether a battle is won or lost . . "

General LeRoy interrupted. "The computer runs these analyses for both sides, so we can see what's happening to Them, too."

The CIA man gestured impatiently. "War games simulations aren't new.

You've been doing them for years."

"Yes, but this machine is different," Ford pointed out. "It not only gives a much more detailed war game. It's the next logical step in the development of machine-simulated war games." He hesitated dramatically.

"Well, what is it?"

"We've added a variation of the electro-encephalograph . . ."
The CIA man stopped walking. "The electro-what?"

"Electro-encephalograph. You know, a recording device that reads the electrical patterns of your brain. Like the electro-cardiograph."

"Oh."

"But you see, we've given the EEG a reverse twist. Instead of using a machine that makes a recording of the brain's electrical wave output, we've

developed a device that will take the computer's readout tapes, and turn them into electrical patterns that are put into your brain!"

"I don't get it."

General LeRoy took over. "You sit at the machine's control console. A helmet is placed over your head. You set the machine in operation. You see the results."

"Yes," Ford went on. "Instead of reading rows of figures from the computer's printer . . . you actually see the war being fought. Complete visual and auditory hallucinations. You can watch the progress of the battles, and as you change strategy and tactics you can see the results before your eyes."

"The idea, originally, was to make it easier for the General Staff to visualize

strategic situations," General LeRoy said.

"But every one who's used the machine has either resigned his commission or gone insane," Ford added.

The CIA man cocked an eye at LeRoy, "You've used the computer,"

"Correct."
"And you have neither resigned nor cracked up."

General LeRoy nodded. "I called you in."

Before the CIA man could comment, Ford said, "The computer's right inside this doorway. Let's get this over with while the building is still empty."

They stepped in. The physicist and the general showed the CIA man through the room-filling rows of massive consoles.

"He's all transistorized and subminiaturized, of course," Ford explained, "That's the only way we could build so much detail into the machine and still have it small enough to fit inside a single building."

"A single building?

"Oh yes: this is only the control section. Most of this building is taken up by the circuits, the memory banks, and the rest of it."
"Hm-m."

They showed him finally to a small desk, studded with control buttons and dials. The single spotlight above the desk lit it brilliantly, in harsh contrast to the semidarkness of the rest of the room.

"Since you've never run the computer before," Ford said, "General LeRoy

will do the controlling. You just sit and watch what happens."

The general sat in one of the well-padded chairs and donned a grotesque headgear that was connected to the desk by a half-dozen wires. The CIA man took his chair slowly.

When they put one of the bulky helmets on him, he looked up at them, squinting a little in the bright light. "This . . . this isn't going to . . . well, do me any damage, is it?"

"My goodness no," Ford said. "You mean mentally? No, of course not. You're not on the General Staff, so it shouldn't...it won't... affect you the way it did the others. Their reaction had nothing to do with the computer per se..."

"Several civilians have used the computer with no ill effects," General LeRoy said. "Ford has used it many times."

The CIA man nodded, and they closed the transparent visor over his face.

He sat there and watched General LeRoy press a series of buttons, then turn a dial.

"Can you hear me?" The general's voice came muffled through the helmet.

"Yes," he said.

"All right. Here we go. You're familiar with Situation One-Two-One? That's what we're going to be seeing."

Situation One-Two-One was a standard war game. The CIA man was well acquainted with it. He watched the general flip a switch, then sit back and fold his arms over his chest. A row of lights on the desk console began blinking on and off, one, two, three ... down to the end of the row, then back to the beginning again, on and off, on and off. ...

And then, somehow, he could see it!

He was poised incredibly somewhere in space, and he could see it all in a funny, blurry-double-sighted, dream-like way. He seemed to be seeing several pictures and hearing many voices, all at once. It was all mixed up, and yet it made a weird kind of sense.

For a panicked instant he wanted to rip the helmet off his head. It's only an illusion, he told himself, forcing calm on his unwilling nerves. Only an illusion.

But it seemed strangely real.

He was watching the Gulf of Mexico. He could see Florida off to his right, and the arching coast of the southeastern United States. He could even make out the Rio Grande River.

Situation One-Two-One started, he remembered, with the discovery of missile-bearing Enemy submarines in the Gulf. Even as he watched the whole area—as though perched on a satellite—he could see, underwater and close-up, the menacing shadowy figure of a submarine gliding through the crystal blue sea.

He saw, too, a patrol plane as it spotted the submarine and sent an urgent radio warning.

radio warning.

The underwater picture dissolved in a bewildering burst of bubbles. A missile had been faunched. Within seconds, another burst—this time a

nuclear depth charge—utterly destroyed the submarine.

It was confusing. He was everyplace at once. The details were overpowering, but the total picture was agonizingly clear.

Six submarines fired missiles from the Gulf of Mexico. Four were immediately sunk, but too late. New Orleans, St. Louis and three Air Force

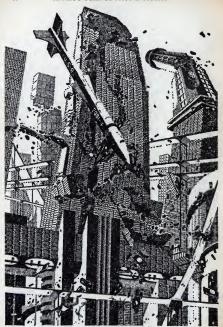
bases were obliterated by hydrogen-fusion warbeads.

The CIA man was familiar with the opening stages of the war. The first missile fired at the United States was the signal for whole fleets of missiles and bombers to launch themselves at the Enemy. It was confusing to see the world at once: at times he could not tell if the firehall and mushroom

cloud was over Chicago or Shanghai, New York or Novosibersk, Baltimore or Budapest.

It did not make much difference, really. They all got it in the first few hours of the war; as did London and Moscow, Washington and Peking, Detroit and Delhi, and many, many more.

The defensive systems on all sides seemed to operate well, except that



there were never enough anti-missiles. Defensive systems were expensive compared to attack rockets. It was cheaper to build a deterrent than to defend against it.

The missiles flashed up from submarines and railway cars, from underground silos and stratospheric jets; secret ones fired off automatically when a certain airbase command port ceased beaming out a restraining radio signal. The defensive systems were simply overloaded. And when the bombs ran out, the missiles carried dust and germs and gas. On and on. For six days and six firelit nights. Launch, boost, coast, re-enter, death,

And now it was over, the CIA man thought. The missiles were all gone. The airplanes were exhausted. The nations that had built the weapons no longer existed. By all the rules he knew of, the war should have been ended.

Yet the fighting did not end. The machine knew better. There were still many ways to kill an enemy. Time-tested ways. There were armies fighting in four continents, armies that had marched overland, or splashed ashore from the sea, or dropped out of the skies.

Incredibly, the war went on. When the tanks ran out of gas, and the flame throwers became useless, and even the prosaic artillery pieces had no more rounds to fire, there were still simple guns and even simpler bayonets and swords.

The proud armies, the descendents of the Alexanders and Caesars and Timujins and Wellingtons and Grants and Rommels, relived their evolution in reverse.

The war went on. Slowly, inevitably, the armies split apart into smaller and smaller units, until the tortured countryside that so recently had felt the impact of nuclear war once again knew the tread of bands of armed marauders. The tiny savage groups, stranded in alien lands, far from the homes and families that they knew to be destroyed, carried on a mockery of war, lived of the land, fought their own countrymen if the occasion suited, and revived the ancient terror of hand-vielded, personal, one-head-at-a-time killing.

The CIA man watched the world disintegrate. Death was an individual business now, and none the better for no longer being mass produced. In agonized fascination he saw the myriad ways in which a man might die. Murder was only one of them. Radiation, disease, toxic gases that lingered and drifted on the onco-innocent winds, and—finally—the most efficient destroyer of them all: starvation.

Three billion people (give or take a meaningless hundred million) lived on the planet Earth when the war began. Now, with the tenuous thread of civilization burned away, most of those who were not killed by the fighting itself succumbed inexorably to starvation.

Not everyone died, of course. Life went on. Some were lucky.

A long darkness settled on the world. Life went on for a few, a pitiful few, a bitter, hateful, suspicious, savage few. Cities became pestholes. Books became fuel. Knowledge died. Civilization was completely gone from the planet Earth.

The helmet was lifted slowly off his head. The CIA man found that he was too weak to raise his arms and help. He was shivering and damp with perspiration.

"Now you see," Ford said quietly, "why the military men cracked up when they used the computer."

General LeRoy, even, was pale, "How can a man with any conscience at all direct a military operation when he knows that that will be the consequence?"

The CIA man struck up a cigarette and pulled hard on it. He exhaled sharply. "Are all the war games . . . like that? Every plan?"

"Some are worse." Ford said. "We picked an average one for you. Even some of the 'brushfire' games get out of hand and end up like that,

"So . . . what do you intend to do? Why did you call me in? What can I do?"

"You're with CIA," the general said, "Don't you handle espionage?"

"Yes, but what's that got to do with it?"

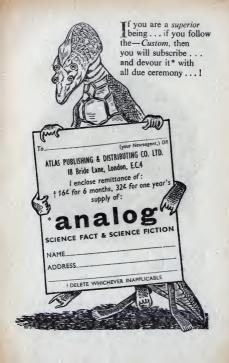
The general looked at him. "It seems to me that the next logical step is to make damned certain that They get the plans to this computer . . . and fast!"



IN TIMES TO COME

Coming up next month is a lead story by Ted Thomas. For years, sciencefiction authors have been trying to write the weather-control story. The main trouble is that the story is simply too darned big to tell. Ted Thomas has, I think, done it, It's about a snowstorm on one square mile of Southern California in mid-July . . . and that means, of course, it concerns the entire Solar System! And Jack Schoenherr's cover for it is beautifully suitable. It'll take two looks to see what the cover really shows, though.

THE EDITOR.



Intelligence is a great help in the evolution-by-survival—but intelligence without muscle is even less useful than muscle without brains. But it's so easy to forget that muscle—plain bhysical force—is imbortant too!

Hustrated by Schoenherr



SIGHT GAG

by Larry M. Harris

DOWNSTAIRS, the hotel register told Fredericks that Mr. John P. Jones was occupying Room 1014. But Frederick (didn't believe the register. He knew better than that. Wherever his man was, he wasn't in Room 1014. And whoever he was, his real name certainly wasn't John P. Jones. "P for Paul." Fredericks muttered to himself. "Oh, the helpful superman, the man who knows better, the man who does better."

Fredericks had first known of him as FBI Operative 71-054P, under the

name of William K. Brady. "And what does the K. stand for?" Fredericks muttered, remembering. "Killer" Brady wouldn't be the man's real name, either. FBI Operatives had as many names as they had jobs; that much was elementary. Particularly operatives like Jones-Brady-K. "Special talents," Fredericks muttered, "Psi powers," he said, making it sound like a curse. "Superman."

Upstairs, in Room 1212, the superman sat in a comfortable chair and tried to relax. He saan't a trained telepath but he could read surface thoughts if there were enough force behind them, and he could read the red thoughts of the man downstairs. They worried him more than he wanted to admit, and for a second he considered sending out a call for help. But that idea died before it had been truly born.

Donegan had told him he could handle the situation. Without weapons, forbidden to run, faced by a man who wanted only his death, he could handle the situation.

Sure he could, he thought bitterly.

Of course, if he asked for reinforcements he would undoubtedly get them. The FBI didn't want one of its Pel Operative stilled; there weren't enough to go round as it was. But calling for help, when Donegan had specifically told him he wouldn't need it, would mean being sent back a grade automatically. A man of his rank and experience, Donegan had implied, could handle the job solo. If he couldn't—why, then, he didn't deserve the rank. It was all very simple.

Unfortunately, he was still fresh out of good ideas.

The notion of killing Fredericks—using his telekinetic powers to collapse the hotel room on the man, or some such, even if he wasn't allowed to bear arms—had occurred to him in a desperate second, and Donegan had turned it down very fattly. 'Look,' "the Fal' Section chief had told him,' you got the guy's brother and sent him up for trial. The jury found him guilty of murder, first degree, no recommendation for mercy. The judge turned him over to the chair, and he fries next week."

"So let Fredericks take it out on the judge and jury," he'd said. "Why do I have to be the sitting duck?"

I mare to be the sitting about

"Because . . . well, from Frederick's point of view, without you his bother might never have been caught. It's logic—of a sort." "Logic, hell," he said. "The guy was guilty. I had to send him up. That's

my job."

"And so is this," Donegan said. "That's our side of it. Fredericks has friends—his brother's friends. Petty criminals, would-be criminals, unbalanced types. You know that. You've read the record."

"Read it?" he said. "I dug up half of it."

Donegan nodded. "Sure," he said. "And we're going to have six more cases like Frederick's brother—murder, robbery, God knows what else—unless we can choke them off somehow."

"Crime prevention," he said. "And I'm in the middle."

"That's the way the job is," Donegan said. "We're not supermen. We've got limits, just like everybody else. Our talents have limits."

He nodded. "So?"

"So," Donegan said, "we've got to convince Frederick's friends-the

unbalanced fringe-that we are supermen, that we have no limits, that no matter what they try against us they're bound to fail."

"Nice trick," he said sourly.

"Very nice," Donegan said. "And what's more, it works. Nobody except an out-and-out psychotic commits a crime when he hasn't got a hope of success. And these people aren't psychotics; most criminals aren't. Show them they can't get away with a thing—show them we're infallible, all-knowing, all-powerful supermen—and they'll be scared off trying anything." But killing Fredericks would do that just as well-" he began.

Donegan shook his head. "Now, hold on," he said. "You're getting all worked up about this. It's your first time with this stakeout business, that's all. But you can't kill him. You can't kill except when really necessary. You

know that."

"All right. But if he's going to kill me-"

"That doesn't make it necessary, not this time," Donegan said. "This vengeance syndrome doesn't last forever, you know. Block it, and you're through with it. And think how much more effective it is, letting Fredericks go back alive to tell the tale."

"Think how much more effective it would be," he said, "if Fredericks managed to get me."

"He won't," Donegan said.

"But without weapons-" "No Psi Operative carries weapons," Donegan said. "We don't need

them. We're supermen . . . remember?" He twisted his face with a smile. "Easy for you to talk about it," he said.

"But I'm going to have to go out and face it-"

"We've all faced it," Donegan said. "When I was an Operative I went through it, too. It's part of the job." "But-"

"And I'm not going to tell you how to do the job," Donegan went on firmly, "Either you know that by now, or you don't belong here."

He got up to leave, slowly. "It's a fine way to find out," he said mournfully.

Donegan rose, too, "Good luck," he said. And meant it, too,

That was the chief for you, he thought. Send you out into God knows what with no weapons, no instructions, lots of help planted for the man

who wanted to kill you-and then wish you good luck at the end of it. Sometimes he wondered why he didn't go in for some nice, peaceful job of work-like rocket testing, for instance,

Fredericks, downstairs, was deciding to do things the subtle way. The man upstairs-Jones, Brady or whatever his name was-deserved what he was going to get. Psi powers were all very well, but there were defenses against them. Briefly he thought of the man who'd sold him the special equipment, and wondered why more criminals didn't know the equipment existed. It worked; he was sure of that. Fredericks knew enough of general psi theory to know when somebody was handing him a snow job. And the equipment was no snow job.

A force shield, that was the basic thing, A shield with no points of entrance for anything larger than air molecules. Sight and sound could get through, because the shield was constructed to allow selected vibrations and frequencies. But no psi force could crack the shield,

Fredericks had sat through a long explanation. Psi wasn't a physical force; it was more like the application of a mental "set," in the mathematical sense, to the existing order. But it could be detected by specially built instruments—and a shield could be set up behind which no detection was possible. It wasn't accurate to say that a psi force was blocked by the shield; no construct can block that which has no real physical existence. It was, more simply, that the shield created a framework inside of which the universe existed in the absence of psi.

That wasn't very clear, either, Fredericks thought; but mathematics was the only adequate language for talking about psi, anyhow. It had been the theory of sets that had led to the first ideas of structure and rationality within the field, and the math had gotten progressively more complex ever

since.

Psi couldn't get through the shield, at any rate; that was quite certain. And very little else could get in, or out. There was only one point of exit. Unholstering his gun and aiming it automatically keyed the shield to allow passage of a bullet, and the point of exit was controlled by the gun's aiming, It was efficient and simple to handle.

But Fredericks wasn't depending on the shield alone. There was a binder field, too—a field which linked him to the surrounding area, quite tightly. That took care of the chance that the Psi Operative would try to pick him up, force shield and all, and throw him out a window or through the roof, With the binder field in operation, no psi force could move him an inch.

A plug gas mask, too, inserted into the nostrils. The shield plus the mask's pack held two hours' worth of air—just in case the Psi Operative tried to throw poisonous molecules through the force shield, or deprive him of oxygen.

And then there was the blindfold. Such a simple thing, and so effective,

Upstairs, the Psi Operative caught the sequence of thoughts. Did the FBI have to do such a thorough job, he wondered bitterly. The equipment, he knew, would do everything Fredericks thought it would do. It was important that Fredericks go up against the Operative thinking he was completely protected—in that way his final defeat would be most effective. He'd have guarded against every possible failure—so, when he failed, there would be nothing to explain it.

Except the "fact" that the Psi Operatives were supermen.

He gritted his teeth. It would be nice, he reflected, to be a real superman. But any talent has its limits. And, even allowing for that, only Donegan and a very few others could handle the full theoretical potentials of their talents. In theory, a telekineticist could move any object with his mind that be could move with his hands. That was a rough rule of thumb, but it worked. The larger objects were barred by sheer mass; no matter what kind of force you're using, there's a limit to how much of it you can apply.

The smaller objects—molecules, electrons, photons—simply took practice and training. First the object had to be visualized, and the general structure memorized. Then the power had to be controlled carefully enough so that

you moved just what you wanted to move and not, for instance, shift the Empire State Building while trying to lift a molecule out of its topmast.

If was possible, in theory, to create full sensory hallucinations by juggling electron streams and molecules within the brain. But memorizing the entire structure of the brain was a lifelong task, since you also had to allow for individual variation, and that meant working with "tracking" molecules inside each brain before any work began. Most Operatives stuck to one area—usually, as most effective, sight or sound.

He was a sight man. He could create any visual hallucination, as long as the subject was within a twenty-five-foot range. Beyond that, control of the fantastically small electrons and photons simply became too diffused.

But Fredericks had a shield. And in case the shield didn't work, he was coming with a blindfold.

The Psi Operative had no weapons, no reinforcements, no chance to run
—nothing except his psi talent, which Fredericks had defenses against, and
his brains.

But there had to be a way out.

Didn't there?

The desk clerk looked young and comparatively innocent. Fredericks ambled over, taking his time about it. The clerk looked up and smiled distantly. "Yes, sir?"

"You've got a man registered here," Fredericks said, in crisp, official tones.

"He gave the name of John P. Jones—"

The clerk was consulting a card file. "Yes, sir," he said brightly. "Room 1014."

"He's at work on an FBI matter," Fredericks said. "Naturally, this is private and confidential..."

"Naturally," the clerk said in a subdued tone. "But I-"

"I'm assigned to work with him," Fredericks said. "You understand."

"Of course, sir," the clerk said, trying to look as if he did.

Fredericks took a deep breath. "I know he's here, but I don't know his

room number," he said. "Some red-tape mixup."
"He's in 1014," the clerk said hopefully.

Fredericks shook his head. "Not that," he said. "The real room number. Look, I've got to get to him immediately—"

"Of course, sir," the clerk said. "Identification, sir?"

Fredericks grinned and fished in his pockets. Naturally, he didn't come up with a thing; FBI identification was infra-red tested, totally unmistakable and unavailable to non-Operatives under any circumstances whatever. "Got it here some place," he muttered.

The clerk nodded. "Of course, sir," he said. "No need to waste time. I understand."

Fredericks stopped and stared. "You what?"

"The room, sir, is 1212," the clerk said. "Would you like me to accompany you..."

"No, thanks," Fredericks breathed. "Tll find it myself." The man was too easy to find, he thought savagely. It ought to be tough to find him—but it's easy.

Remotely, that idea bothered him. But what difference did it make, after all? He had all the protection in the world. He had all the protection he was going to need. And all the time to fire one shot. Doing it blindfolded was going to be tough, but not insuperably tough. Fredericks had spent a week practicing, and he could locate a fly by sound within two inches, nineteen times out of twenty. That, he thought, was going to be good enough.

Upstairs, the Psi Operative thought so, too.

There had to be a way out, he told himself desperately.

But he couldn't find it.

He couldn't even come close.

On the way to Room 1212, he flipped on the shield, the mask, the binder field. Now let the superman try something, he thought wildly. Now let him try his tricks! He attached the blindfold as he got off the elevator. He could see Room 1212, three doors down the corridor, twenty steps—and then the blindfold was on. From now on he worked in the dark.

He felt the skeleton key in his palm and flipped the shield off for a second; then the key was in the lock, the shield back on, protecting him. The door opened slowly.

He heard it shut behind him. Then there was silence. He drew his gun. "Go ahead," a muffled voice said from his right. "Go ahead and try something, Fredericks."

He whirled and almost fired—but voices could be thrown. He listened again. There was silence... not quite silence... a movement... a rustle—Breathing was faint but unmistakable. It gave him a new direction.

Breathing couldn't be faked.

He pictured the Psi Operative, in one flash of imagination, trying to get through the shield, sweating as he strained helplessly against the force shield, the binder field, the mask, the blindfold—oh, there was no way out for the poor superman. no way at all.

And Psi Operatives didn't carry weapons or anything else. They depended on their powers, and that was all.

And he'd neutralized those powers.

The breathing gave him the direction. He turned again, bringing the gun up, and fired six shots without a second's break between them. There was a sound like a gasp, and then nothing.

Nothing at all.

Grinning wildly, Fredericks whipped off the blindfold and switched off his shield in one triumphant motion. There, on the floor—

There, on the floor, was a nice gray rug with nobody at all lying dead on top of it. In the half-second it took Fredericks to see that, the Pai Operative moved. Fredericks tossed the empty gun at him and missed; the man was coming too fast. He guarded his face but the Pai Operative didn't go for the face. Instead his hands went swinging up and out and back.

The sides of the palms landed neatly on the twin junctions of Fredericks' arms and shoulders. Fredericks let out a shriek as his arms turned to acutely painful stone, and the Psi Operative stepped back and moved again in one blinding motion. This time the solar plexus was the target for one balled fist.

And then, of course, it was all over.

"Of course it was simple," Donegan said, "Anyone could have thought of it-and I knew you would."

"All the same," the Psi Operative said, "I nearly didn't."

Donegan nodded, "If you hadn't," he said, "we'd stationed a man downstairs who'd memorized your room. He could have done the job, too."

The Operative blinked. "Who?" he said.

"Desk clerk," Donegan said.

"Why didn't you tell me-"

"Now, use your head," Donegan said. "If you'd known you were all right, you'd never have thought of the answer. You had to prove you could do it-prove it to yourself as well as to me."

"But-"

"And you had to prove you could beat him on his grounds, too, as well as yours," Donegan went on. "You had to take him, not only with psi forces, but with the only weapons a Psi Operative is allowed to carry.'

"Fists." the Operative said, "Sure, Judo and Karate are standard subjects

-every Operative has to know them. What's so tough about that?" "Nothing," Donegan said. "Nothing at all-except for Fredericks. He's

been beaten on your ground, and on his own. Now he knows he's licked. Standard operating procedure,"

"I guess so," the Operative said. "And after all." Donegan said, "now that you're going up a grade-"

"Now that I'm what?"

"That," Donegan said, "was your promotion test, friend. And you passed." There was a second of absolute silence. Then the Operative said: "And it was all so simple."

"Sure," Donegan said. "Simple enough so that you get a promotion out

of it-and Fredericks gets sixty days for attempted assault."

"Not ADW-assault with a deadly weapon-because we've got to keep up the myth," the Operative said. "Psi Operatives are untouchable. No such

thing as a deadly weapon for a Psi Operative." "Which is nonsense." Donegan said, "but necessary nonsense. I wonder

if Fredericks will ever figure out how you got him."

"I wonder," the Operative said. "He'll know about karate, of course,"

"Karate's hand-to-hand fighting," Donegan said, "That was his field. No.

I mean our field. Psi."

"It makes a nice puzzle for him, doesn't it?" the Operative said, and grinned, "After all, I didn't touch him-couldn't, in any way. He'd shielded himself perfectly from any telekinetic force-and I had no weapons. I couldn't even get to him barehanded because of his shield and the binder field. He had me located-no tomfoolery about that. He fired six shots at me. pointblank at can't-miss range."

"But you got him," Donegan said.

"Sure," the Operative said. "Simplest thing in the world."

"All you had to do-" Donegan began.

"All I had to do," the Operative finished for him, "was use my mind to move the bullets-as he fired them."

SUPPRESSED INVENTION

by John W. Campbell

A "suppressed invention" is one that Vested Interests have suppressed for their Own Selfish Reasons . . .? And of course that can only mean the Big Money Boys, huh . . .? Not this one, though . . .

THE high point in the movie "Edison The Man", featured a scene in which we see Edison and his crew of laboratory workers gathered around a single glowing electric light . . . waiting for it to burn out. And hoping it

will last a long, long time.

The audience, of course, knew all the time that this lamp was really going to work. But, if you happened to see that move, did you think to wonder just what power supply was running that marvelous new invention, the electric light? It wasn't plugged into the wall outlet, you know! Edison and his gang didn't satr inventing electrical power distribution systems until after they'd developed a working electric lamp, and a workable electric generator!

After Galvani first observed a dead frog's leg twitch when touched with two different metals, and Volta did his work on electrochemical cells, science for the first time had available a source of current electricity: the electrochemical cell—which was as remarkable and immense a break-through in its day, as the atomic pile was in 1942—and led to the Voltai-Pile.

The early work done in electrochemistry—the first isolation of sodium, potassium, etc., by electrolytic methods—stemmed from the development of the electrochemical cell, the only source of electric power Man had.

That first electric lamp may have been powered by a type of battery that Edison had developed—one known as the Edison-Leland cell.

Dynamos existed at the time Edison developed his lamp-but they were marvelously inefficient, unreliable and impractical. The Edison-Leland cell was, actually, a type of fuel cell-not in quite the modern meaning of the term, but nonetheless effectively a true fuel cell. It burned zinc, lye, and air and produced electric power. The zinc plates were immersed in a sodium or potassium hydroxide solution; the positive plates were copper with copper oxide depolarizer. The cells delivered about 0.8 volts, and would supply a good husky current. They were simple, rugged, and relatively cheap-zinc is, actually, a fairly cheap fuel. The battery would yield a good current until the copper oxide gave out, whereupon the voltage dropped off sharply. So then the copper plates were simply lifted out of the battery, dunked in clear water, and shoved in the oven for a while-and the hot copper absorbed oxygen from the air, formed copper oxide again, and was put back for another go-round.

Nobody was much interested in storage batteries in those days; there wasn't any reason whatever for a storage battery, since the only practical source of power with which to charge the battery would be a primary battery! Why waste time and effort, then, building the storage battery at all? Once Edison developed the electric light, and the technology of a dynamo

that was practical for supplying power efficiently, and then the technology necessary to ship power from dynamo to point of use, for the first time storage batteries became practical devices. For the first time, there was a source of electric power cheaper than that produced by "burning" zinc electrochemically, and therefore cheap enough to make it desirable to store it instead of simply producing it on the spot.

The Planté storage cell-the original lead-acid storage battery-was invented long before, but strictly due to accident and misunderstanding; Planté had been trying to store electricity all right-but he was trying to make a condenser-type storage device, having no idea of inventing a secondary battery at the time. The original lead-acid cell consisted of nothing more complex than two sheets of lead dipped in dilute sulfuric acid; it's a fundamental system that works fine today, of course, as it did then-and for some special purposes makes a highly desireable type of battery. The capacity is limited, it's extremely heavy ("heavy as lead!") but it has a long, long life. Once Edison developed electric power technology, however, the desir-

ability of having a secondary cell became apparent-and for the first time serious efforts were directed toward their development. Edison always did think direct current was the only right way to work with electricity; for one thing, the problems of alternating current engineering were, actually, considerably beyond the theoretical capabilities of mathematical physics at

the time.

But direct current presents some extremely rugged problems in shipping power from A to B. You can't build DC transformers to step voltages up and down, which means you've got to work with low-voltage, high-current equipment. Copper cables as thick as a man's arm are expensive-particularly when you want to run them ten or fifteen miles!

So Edison set about developing a better "bucket" to carry his "juice" from the end of his pipe-line to points beyond-and to make mobile electric-

powered devices possible.

The Edison nickel-iron storage battery resulted from that effort; a storage

battery that was enormously superior to anything that had existed, far lighter than the lead-acid type, far more rugged mechanically, chemically,

and electrically. It had very real, and very great advantages over the leadacid cells that were its only competitors—and a couple of minor disadvantages. Only—the minor disadvantages just happened to be crucial, and almost completely ruined its potential.

The Ni-Fe battery uses an electropite of KOH, laced with a little LiOH; the alkalie electrolyte is not anywhere near as destructively corrosive as sulfuric acid, and actually protects most metals against corrosion. The cells, therefore, instead of having to be made of glass or hard rubber, could be made of nickelplated sheet steel.

The Edison battery is almost incredibly resistant to destruction either mechanically, chemically, or electrochemically; the plates are made of nickel-plated steel with small tubes of nickel oblide for the positive, and small flattened packets of iron for the negative. Currently, nickel sells for about 50e per pound, and iron is, of course, even cheaper.

The Edison Ni-Fe battery is very decidedly lighter per kilowatt-hour of capacity, and per ampere-hour, than the best lead-acid batteries. Their normal service life is about 5 to 10 times that of a lead-acid cell—15 to 20 years of service is quite normal for an Edison cell.

So—then how come we don't see Edison cells in use all around us? How come this wonderful battery never got much beyond first base?

Oh, they were used all right they powered battery-operated electric locomotives, electric trucks, and are today, being used in electric

fork-lift trucks, baggage trucks and the like. They are, beyond question, excellent batteries.

Receivent batteries.

But, look—how come the U.S. Navy didn't use these rugged, light,



Fig. 1. This is a Gould-National Nicad cell in cut-away; both Edison and Nicad cells use the general structure made possible by the very high strength of the nickel-plated steel plates, and steel cell case. Separators aren't needed, because the plates themselves are adequately rigid.

long-lived, reliable efficient cells in the pre-nuclear submarines? Certainly there was a place for a rugged, reliable, long-lived, low-weight, high-capacity battery if ever there was one—and it's a vehicle application, such as Edison had in mind when he worked out the battery?

Here, it seems, was a major invention that was somehow being neglected.

Well, there were a couple of leeetle defects.

An Edison cell will not deliver its charge in a great rush of high-current output. It's got lots of stored energy, maybe—but it insists that you be patient about taking it out. Nothing hurried about it. The normal voltage per cell is approximately 1.2 volts; if you spend 5 to 8 hours drawing out the energy, it's an efficient cell. Try getting it all out in, say, 20 minutes—and you get only a small fraction of the charge, and the voltage collapses to about 0.2 volts.

In a submarine, the standard system is to have two electric motors, and two big battery banks. For underwater cruising, the batteries are connected in parallel, and the motors in series—say a 100 volt battery, working into a 200 volt motor. For getting some place at a more active speed, the batteries are connected in parallel, and the motors in parallel—a 100 volt battery working into 100 volt motors. And when there is reason to get the hell otta there, but fast the technique is to connect the battery banks in series, and the motors in parallel—a 200 volt battery working into a 100 volt motors.

Try that last trick with an Edison battery bank, and you'll find you have a 50 volt battery working into a 100 volt motor; the cell voltage simply

collapses under heavy current demand.

The reason you haven't seen Edison batteries around much lies right there—the voltage collapses under any sudden heavy-current load, and the great use for storage batteries that developed in the 20th century was, of course, for automobile starting, a use that consumed millions of batteries every year. And the service involves exactly the type of work an Edison battery can nor handle; the standard six-volt starter system for a standard light car such as the Ford or Chevrolet of a few years ago imposed a load of up to 550 ampress on the battery when starting a cold, stiff, new engine. Even a well-broken-in engine, on a warm summer day, would draw 300 ampress or so.

For submarine work, however, the Edison cell has another unpleasant little habit; the iron electrode gases off hydrogen continuously. It gases off hydrogen while it's being charged; it gases off while it's attanding isle, and it gases off while it's working. And submariners simply do not like having hydrogen gas added to the atmosphere of their cramped little ship full of all sorts of electrical equipment. Hydrogen may not be poisonous in the usual

sense-but in a submarine's atmosphere it's strictly sudden death!

More generally serious is the fact that that hydrogen gas is generated at the expense of the chemical energy stored in the iron of the cathode—it's due to self-discharge of the energy you want stored. An Edison battery simply will not hold a charge; it leaks off in the form of hydrogen bubbles. One of the inefficiency factors in the Edison battery is the fact that hydrogen bubbles are discharged continuously during charge—at the expense of the energy of the charging current. Edison battery operators say "if it ain't gassing off, the iron ain't taking a charge."

Put an Edison battery on the shelf for a few months, and it will be com-

pletely discharged when you come back to it.

Of course, that doesn't harm an Edison cell in the slightest; the normal technique for putting Edison cells in storage in a warehouse is to strap their terminals together—they're normally stored for weeks, months, or years if you wish, short-circuited. While it doesn't harm the cells—it does make them useless as emergency power reserves in many instances. When you need the stored power, you discover it's gone off into the wild blue yonder in the form of hydrogen bubbles.

So, the lead-acid storage battery, with its long catalog of extremely serious



Fig. 2. One handful of Nicad sintered-plate cells can deliver power enough to start a standard 6-volt light automobile. Five cells deliver just over 6.2 volts.

faults, won the market because it had one essential, and one desirable, characteristic: The lead-acid cell is able to throw very beavy currents without complete voltage collapse, which was essential for automobile starting, and it's first price, its purchase price, is far lower than that either of the two competing batteries.

Its faults, however, are major, numerous, and inherently incurable.

The first fault is obviously incurable; it's heavy as lead. Actually, a leadacid battery is even more weight-loaded than that, because the sulfuric acid has to serve two functions. The chemical reactions of the lead-acid battery are:

Anode reaction: $PbO_2 + H_2SO_4 = PbSO_4 + H_2O + O$ -Cathode reaction: $Pb + H_2SO_4 = PbSO_4 + 2H^+$ Combined Reaction: $PbO_2 + Pb + 2H_2SO_4 = .2PbSO_4 + 2H_2O$

The sulfuric acid is consumed, and water produced, which is why the state of charge in a standard lead-acid battery can be determined by measuring the specific gravity of the electrolyte. The state of charge of an Edison battery



Fig. 3. . . . and this is a closeup of "lead-battery-disease". These are not bacteria colores on a biologist's culture-plate, but growth-rings of white lead sulfate in process of ruining a lead-acid battery plate. The useful area of the whole plate was about 1½ x ½ inches.

cannot be so determined, because in the Ni-Fe cell, the electrolyte serves, in effect, simply as a sort of conveyor belt for OH- ions. The reactions in the Edison cell are:

Andoe reaction: Ni(OH)₃ = Ni-(OH)₂ + OH-Cathode Reaction: Fe + 2OH = Fe (OH)₂

Combined reaction: 2Ni(OH)₃ + Fe = 2Ni(OH)₂ + Fe (OH)₂

Fig. 4. Cut-away view of the typical plug-in-the-wall rechargeable Ni-Cd flashlight battery unit. This one's the Nicad Battery Co. design, but Nicad supplies them to a number of companies for sale under assorted brand-names.



In this system the electrolyte—potassium hydroxide—does not enter into the reaction; it merely serves to transport OH^\perp lons from the Ni anode to the Fe cathode.

All of which didn't seem to mean much, once the electric power lines got spread across the country—or at least, across those parts of the world where



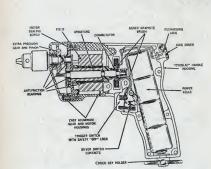


Fig. 6. Cut-away of the Black & Decker cordless drill shows how little space could be alloted to batteries. Under max load, the motor draws 55 amperes from the half - D size cells. Bet the engineers had fun designing a trigger switch to handle that current with only five volts maximum.

there was conomic wealth enough to be able to do anything about electric power problems. There's been no great point in running highly expensive electric power facilities into Amazon jungle areas—nor any great demand from such areas for portable stored power, no demand great enough to support an industry, to reward a research effort to produce a better storage battery. Nobody thought there was any reward to be gained from devoting the time, effort, and ingenuity required to produce a really new, and really good storage battery. Besides, ever since Edison's dynamos first went to work, people have known that batteries were pretty puny stuff, not really good for anything except very temporary heavy loads, like car starting, or small loads like children's toys. Batteries aren't real power sources!

And everybody was wrong.

Above I mentioned that the lead-acid battery had two competitors; the Edison battery was one—the other was one that you couldn't even find out

about in the United States until after WWII!

It just happens that batteries have been something of a hobby of mine for some 35 years; I started experimenting with them as an amatter interest, when I was in high-school. I've never made a formal literature search of the subject, but I generally looked around in libraries to see what books they had on batteries, both primary and secondary, and over the course of years accumulated considerable information on them. Most of it sort of odd-ball stuff, but in the process, learned more than the elementary material about the standard battery types.

In various books, I've learned about some strange ones; I started doing some experiments on fuel cells back in 1932, somewhat before the current

acute interest in the problem.

In the widely-known and respected Chemical Rubber Co. Handbook of Chemistry & Physics, there's a couple of pages devoted to discussing various

types of primary and secondary cells.

Nowhere, before 1945, did I encounter any discussion of the Jungmer battery. The Handbook of Chemistry & Physica Istate available edition still doesn't know the Jungmer Ni-Cd battery exists! Yet that two-page listing describes the Grove, Bussen, Danial, and assorted other one and two fluid cells. It mentions the main Accumulator (PbO,—Zn in H₂SO₄; chiefly remarkable for having powered the electric car that, for several years, held the world's automobile speed record of about 78 mph) and several others—as well as, naturally, the lead-acid and the Edison cell.

It seems that, somehow, everybody thought the Jungner cell was a minor, unimportant variation of the Edison Ni-Fe cell. Jungner's battery simply used metallic cadmium as the negative instead of metallic iron. Gives essentially the same voltage—cadmium's \$1.70 a pound against iron's so-much-a-ton

price-too unimportant to mention. . .

The basic patents on Jungner's battery were issued in 1899 and the next few years, in England, Germany and Sweden, Jungner was a young Swedish engineer, who had developed a type of electrical fire-alarm. It was a good alarm system, and sold very well—but got into difficulties because the batteries on which it depended weren't dependable. He'd been using primary cetls—dry-cells of the familiar type—and the "shelf-liffe" kilded the batteries while the fire-alarm was waiting for a fire. To save his successful business, Jungner had to come up with a new kind of battery that could be depended

on-and while he was at it, since powerlines made electric power cheap-

why not make the new battery a storage cell?

Édison was looking for a battery that could be used to extend the effective reach of his powerlines; for him, the Ni-Fe was fine. Jungner found the Ni-Fe system, too, at about the same time Edison did—and dropped it quick. That trick of self-discharge into hydrogen bubbles was precisely what he did not want!

The battery Jungner developed uses cadmium metal as the negative electrode material. The positive electrode is, like Bdison's, nickel oxide-hydroxide. (Nobody knows exactly what that electrode actually is; the electrode reaction given above is a rough approximation of what actually happens, but not too close an approximation.) The negative electrode reaction in the Jungner battery is exactly that in the Edison battery, with Cd replacing Fe:

 $Cd + 20H^- = Cd(OH)_2$

At first glance, it does seem like a distinction-without-much-difference sort of thing, doesn't it?

I have a Ni-Cd storage battery the size, shape, and appearance of a standard D-cell flashlight battery—a development of the original Jungner cell—which can slam the needle on my 50 ampere meter against the stop-pin so hard it makes a distinct elink. It can deliver over 150 amperes on short-

circuit.

It will deliver a current of 50 amperes for ninety seconds, and at the end of that time the voltage is still above 50% of the full-charged no-load value! Semi-straighten a standard wire paper-clip and clip it from one end of

Semi-straighted a standard wire paper-cup and cup it from one end of the battery to another—but don't hold on! It will get hot enough to lose most of its spring in a matter of seconds—and the cell won't be bothered in the least.

Repeated discharges at 50 amperes, recharge, and redischarge at that extreme rate, from the little D-cell size Nicad doesn't bother it in the slightest.

A standard lead-acid storage battery drops its voltage to less than 50% of the full rated value—the "volt" battery goes below 3.0 volts; the "12-volt" below 6.0—when the full load of the starter hits it. A Jungner battery of equal ampere-hour capacity drops, under the same load, only about 10%. If you directly replace a lead-acid battery with a Jungner battery of the same capacity and no-load voltage rating, your starting motor is going to get a surprise. The standard "12-volt system" starter motor has to be designed to work on about 5 volts—which is about what it can get when it's trying to start your car on a cold winter morning. With a Jungner battery, it would get about 10 volts—nearly twice what it's expected to get!

The Ni-Cd is no minor modification of the Edison Ni-Fe battery! It's what the Ni-Fe battery should have been, and never came near to being.

The Nicad battery cell delivers almost exactly the same voltage the Ni-Fe cell does: 1.2 volts. (Which means it takes ten Nicad cells for a "12 vol" battery, instead of the six a lead-acid battery requires.) It uses a nickel electrode, just as the Edison does, and a KOH electrolyte, as the Edison does—but from there on out, the differences are enormous!

The Jungner batteries have been available in Europe since the very early 1900's. Like the Edison battery, they're made of nickel-plated steel, and are mechanically, chemically, and electrically extremely rugged. Unlike Edison

cells, they've been used for internal-combustion engine starting right from the beginning—and one Jungor battery put in service starting a diesel engine in 1913 was still in service, as of 1958! A forty-five-year service life suggests the things can really be depended on. If a man bought a new Nicad battery for his car the day his son was born, about the time Junior got his PbD, the battery could be expected to need replacement.

Now here is the remarkable thing; the Ni-Cd batteries could be bought in Europe, in Tibet, in Central Africa and in the South Seas Islands all during the first half of the century—but you couldn't get them in the United

States!

I didn't even find mention of them in technical literature in the United States! As I said, the Chemical Rubber Handbook didn't mention their existence.

existence.

The Ni-Cd battery, it is now clearly evident, is far and away the most reliable, powerful, long-lived storage battery yet developed. It is the only

true, long-lived storage cell that can be truly hermetically sealed.

The Nicad battery actually represents a major new tool for both industry

and science.

Yet technical information about it, even, was practically unobtainable in this country, previous to 1945—and became available then primarily because several hundred thousand Americans had been exposed to their wide-spread use in Europe, while over there on other business. An American Army colonel was primarily responsible for founding the Nicad Battery Co, in Easthampton, Mass., after the war, and making the Jungner type cell available in the United States.

The data above certainly makes a magnificent case for a deliberately suppressed invention, doesn't it? Obviously, the commercial battery companies, with the beautiful lead-acid battery business, combined to prevent development of the Nicad cell? Big Business at work, suppressing an invention, and milking the poor citizen? Just think . . . the lead-acid battery business is practically a management ideal dream of a perfect business! The lead-acid battery has automatic, guaranteed builti-in self-destruction mechanisms that they can't even be accused of putting in deliberately! It's inherent in the lead-acid system that the battery will destroy itself—because the stable form of the lead-suffurie system is PhSO₂—and the system inevitably and inescapably goes slowly and steadily to that condition. There's no way of preventing it.

And this means that they can guarantee that the batteries they sell will destroy themselves in two, three or four years—and that the buyer will,

with perfect certainty, be back for another battery.

But if he buys a Nicad—that's the last you'll see of him. His son will

grow into manhood and buy a battery before he comes back!

Obviously Big Business and the Big Battery Cartels were at work, right?

Yeah . . . obviously. Only the obvious happens to be wrong,

Because that wouldn't account for the fact that the Chemical Rubber Handbook and all the other books on batteries printed in this country during the last half-century ignored the thing. Technology—professional science ignored the battery. Naturally in our technical-based culture, Big Business ignored it too. If the Director of Research thinks the device is unimportant —the executive department in it's going to do anything about 1. One of the best over-all discussions of practical battery technology and management available in this country is the book "Storage Batteries," by Dr. George W. Vinal, of the National Bureau of Standards. The third edition of his book appeared in 1940. In it, he devotes about three pages total to references to the Ni-Cd battery; the rest is 89% devoted to lead-acid cells and 20% to Edison cells. The major technical-data discussion of this authoritative book on storage batteries savs of the Jungener battery.

"Although nickel-cadmium cells are little known in this country, their production in Europe has increased greatly since 1990. They are used for train-lighting, mine lamps, tractors and trucks, military purposes, and, since 1935, for starting and lighting service on buses and trucks. Cadmium is said to be less subject to self-discharge than iron, and is relatively free of passivity at low emperatures. The average voltage of a cell during

discharge is about 1.2 volts."

And that's all Dr. Vinal of the Bureau of Standards considered necessary to say about the Ni-Cd battery. Notice that he says "Cadmium is said to be less subject to self-discharge". This suggests that, as of 1940, Dr. Vinal, the Bureau of Standards battery expert, had not himself investigated Ni-Cd batteries. They'd been on the market since about 1905, and by his own statement, in wide, and rapidly increasing use in Europe for ten years before his book was published.

It wasn't Big Business and Cartels that suppressed the Ni-Cd battery in

this country; it was Big Science.

If a business organization writes to the National Bureau of Standards for information about some new kind of battery they've heard about being used in Europe—you can imagine the enthusiastic report the Bu. Stan. would send them, in view of the fact that they'd been too lethargic to investigate the matter themselves!

The battery experts "knew" they didn't need to waste time and effort investigating the Ni-Cd system; they knew all about the Edison cell, and therefore, since the Ni-Cd was an unimportant modification of the Edison, they didn't need to investigate it.

They didn't even react to the fact that the Jungner Ni-Cd cells were being used to do work that Edison cells can't possibly do-for starting buses,

trucks, and heavy diesel engines!

The Bell Telephone Laboratories had a report worked up by one of their men, about 1947, as to the characteristics of the Nicado batteries. Most of the report had to be prepared from material furnished by the manufacturers, since Bell Labs hadn't had time to investigate the batteries themselves. (After all, they'd been on the market for only 40 years, you know.) At that time, they found that Ni-Cd batteries were very highly desirable for such service as railroad lighting, emergency power and the like in colonial areas; the Ni-Cd cells were the only kind of battery that could remain operating under the mismaintenance provided by completely ignorant native workers. They were liked in India particularly because the Ni-Cd cells were the could tolerain characteries—the temperatures that completely ruined lead-acid and Edison batteries—the temperatures reached in the Indian central plains during mid-summer.

It wasn't Big Business Cartels that kept you from getting the possible developments of the Ni-Cd battery—it was the Big Science cartel that already

knew they didn't have to investigate.

As a matter of fact, the Jungner battery, sad to say, can never replace the lead-acid battery—but for a reason that none of the battery experts I've talked to knew about!

The Ni-Cd system has one permanent, immovable, and absolute block. It can never become a mass-production, high-quantity item. This means, of course, that it will tend to remain expensive, because of hand-tooled con-

struction methods imposed by the small-quantity business.

The reason it can never be a large-scale industry has to do with the poculiar structure of the cadmium nucleus. Cadmium is used as control-rods in nuclear reactors, because the nucleus soaks up neutrons like a sponge, and turns into something else, of course. This characteristic, plus a lew others, contribute to the fact that when the atoms were being cooked up in the stellar atom-furnaces, cadmium was one that didn't stand up well.

There is not one cadmium mine on the entire Earth.

Cadmium is strictly a very small by-product of zinc mining; it is a minor impurity, about 0.25% on the average, in zinc. It is extracted from zinc quite largely because Cd is highly toxic, while pure zinc is non-toxic. Cadmium, like its conger mercury, is exceedingly bad stuff in human metabolism.

Because of this, the price of cadmium, in moderate quantities, is around \$1.70 per pound . . . but if you want a great deal of cadmium, say the quantity needed to make 5,000,000 automobile batteries this year, the price will be about \$800 per pound!

Which suggests that Big Business wouldn't have had any reason to suppress

the invention anyway!

But the failure of science to appreciate that the Jungner battery was an entirely different kettle of fish is indicated by what has been done, since the interest in batteries, both primary and secondary, has been reawakened.

The electric automobile never got anywhere—despite the apparent advantage it had back around 1905. It was quiet, reliable, smooth, odorless, very cheap to maintain—it had lots of advantages. But the gasoline car, stinking, banging, breaking down, rattling, and in various ways offending nose, ears, and sense of economics, won out—largely because you could "recharev" a sealine car in minutes. instead of overnight.

And after the gasoline car won—batteries were for toys, doorbell ringing, and flashlights. For a brief time, in the late 1920's, it looked as though radio receivers were going to give batteries a new job—but then they found out

how to run those from a powerline too.

The first real new interest in batteries came in WWII, when the development of military electronics began to make portable power supplies important. Long-neglected research programs were dusted off, and work was done on elideas nobody'd bothered with for decades. The mercury dry-cell came into production. Batteries of far smaller size came on the market. Then the transistor arrived, and the market for batteries result boomed.

Photographic electronic flash supplied another market for batteries—and about that time the hermetically sealed Ni-Cd storage battery came on the market. It was the first truly sealed storage cell ever sold commercially.

The problem in building a sealed storage cell has always been the danger of gas explosion when the cell is fully charged . . . and the charging current is continued. When all the Ni (OH), has been reoxidized to Ni(OH), if the charging current continues—oxygen begins bubbling off the anode. When

all the cadmium hydroxide has been reduced back to cadmium metal hydrogen starts bubbling off the cathode. If the cell is seaded the gas pressure will build up steadily until something pops. If the cell is not sealed, the electrolyte tends to escape, no matter how carefully you try to trap it—a anyone who had one of the lead-acid storage battery powered radio sets can tell you.

The Ni-Cd system is unique, in making possible a reaction system that completely eliminates ges-off, even when the cell is overcharged. It depends on the fact that oxygen is somewhat soluble in KOH under moderate pressure—and that the finely divided and highly reactive adminima metal in the eathhole of a Ni-Cd battery will react directly with the dissolved oxygen.

to produce Cd(OH),

The very simple trick is that more cadmium hydroxide is built into the cell than the amount equivalent to the nickel oxide installed. Necessarily, then, the nickel anode will reach full-charge condition while there still remains some unreduced Cd(OH),. The anode will, then, tend to start producing free oxygen, before the cathode starts freeing hydrogen.

The oxygen freed from the anode, however, attacks the already-reduced cadmium of the cathode, and turns it back to Cd(OH)s. The net result is that the over-charge current is simply consumed harmlessly by the catalytic

oxidation-reduction of the Cd-Cd(OH)2 system!

Because of that, the Ni-Cd hermetically sealed cells provided a type of storage cell that could be sent into space—which would have been sudden death to any unsealed cell, since the electrolyte would promptly boil away. And it meant a cell that could be permanently wired into delicate electronic equipment without danger of a spray of corrosive fumes. Hence the development of the rechargeable photo-flash equipment.

But another step was in the offing; since about 1946, the Nicad Battery

Company had been working on a new approach to battery plates.

The Edison batteries are decidedly expensive; nickel and iron are cheapenough—but getting the darmed stuff in place, in the form it's needed, is an incredibly elaborate process. The positive plate structure in an Edison battery involves making tubes by wrapping nickeled-steel perforated tape around a mandrel, slipping steel retaining rings over the tube so formed, then ramming the tube full of alternate layers of finely divided precipitated nickel hydroxide and fine nickel flake. (The nickel oxide matterial is a very poor conductor; the nickel flake is added in hopes of improving that situation.) A total of 600 layers of alternate nickel oxide and nickel flake is rammed in, the tube pinched shut, and mounted in a nickeled-steel grid. The cost sin't the materials— "it's the cost of getting the darmed stuff in the form needed, where you need it.

The original Jungner battery suffered from a similar problem—complicated by the fact that cadmium is expensive. The machinery used to make these plates was big, expensive, and specialized—it made it very difficult to produce

many different sizes and styles of batteries.

(The lead-acid battery is cheap not because lead and sulfuric acid are so much cheaper, but because it's so easy to make a paste of lead oxide and glycerine, or other organic material, and "butter" a lead grid with the stuff. Charging the resultant pasted plate converts the anode-charged plates to PbO₈, and the cathode-charged plates to Pb. The whole process is cheap, easy, done by simple machinery, and easily altered as to size and thickness.) The Germans, during WWII, started working on what is now known as the "pressed plate" type battery; it's made essentially of powdered nickel and active material formed under enormous pressure into a quasi-solid

button of active and conductive material.

The Nicad Company, meanwhile, was working on the sintered-plate system—a technique using powder-metallury to make a "biscuit" of externedy porus nickel by lightly compressing nickel powder, and then, by a sudden heavy current, causing the individual grains to weld to each other at their points of contact. The result is a plate that's 80% open holes, and only 20% solid nickel. By chemical techniques (that they talk about, but not of) they load the pores with active material—nicklic salts in the anodeto-be, cadminm in the cathode-to-be.

A number of companies are now importing the Ni-Cd batteries from West Germany, and selling them under American brand names; Nicad-which is now a division of the Gould-National Battery Company—imports and sells under their brand a number of the smallest sizes of Ni-Cd batteries. These range from shirt-button size to overcost-button size—and shapel—in the Nicad brand; Burgess, Everady, and others offer similar West German made button cells, and some flashlight-type batteries of the pressed-plate type. So far, Nicad is the only make of sintered-plate I've encountered.

The pressed-plate and sintered-plate types are not interchangeable-

equivalent!

It's a Nicad sintered-plate type of D-size flashlight cell that can throw a current of 150 amperes. The equivalent D-size pressed-plate cell acts exactly like a first-line high-quality drycell, except that it can be recharged several hundred times. A good, fresh, new drycell, on dead short-circuit, will yield

about 7 amperes; so will a fresh-charged pressed-plate Ni-Cd D-size cell. In addition, the sintered-plate cell has a capacity of four ampere hours, as compared to about 2.5 for the sintered plate. However, you do pay for

the difference—the Nicad sintered-plate cells are more expensive.

But of major importance is this simple fact: The sintered-plate, hermetically sealed Nicad battery is a totally new tool for both industry and science. It

will do things that no other device known has been able to do.

For the first time, battery-powered tools are possible—not toys, but tools. The Black & Decker cordless quarter-inch drill is a full-scale, he-man heavy-work tool, not a battery-operated toy. Four Nicad sintered-plate cells, each D-size in diameter, but only half as high, supply the power. The tool can drill 4-inch holes through cold-rolled steel; when drilling under full load—a 4-inch bit clawing its way into hard steel—the drill-motor draws 55 amperes from the half-D-size cells!

Naturally, the batteries can't maintain that sort of load for any long period—but the tool can drill about five ½-inch holes in ½-inch thick cold-rolled steel on one battery charge. Under more normal loads, it can drill over 100 ½-inch holes in "i-inch" pine boards on a single charge. It's a tool—not a toy! TV service-men, for one group, dearly love the gadget—till.

give them a power-tool up on somebody's roof.

For the first time, there's a chance for real battery-powered tools of all types. And for battery-powered equipment that requires power, great gulps of power, where you can't get at a powerline. Sylvania Electric is bringing out a modification of their "Sun Gun" home movie light gadget—the iodine-

cycle incandescent lamp—that, for the first time, allows you to take movies at night without having to have a handy powerline outlet. On the beach at a picnic—anywhere. It has a canister of Nicad batteries, and supplies

half an hour of brilliant light.

But the sintered-place Nicad offers something entirely different in the way of a scientific tool. The definition of the electrical unit, one fand, is that capacity which, when charged at a rate of one ampere, shows a voltage increase of one ovel per second. By that definition, a penlight size Nicad sintered-plate cell is approximately a one kilofarad condenser. I've used them electronic circuits where a capacitance of the order of 5,000 microfarads would have been the minimum to get the required low-frequency responses because the Nicad cell can be charged forever at up to 20 milliamperes, due to the trick Cd-Cd(OH)₂ reaction with oxygen, they make magnificent fixed-bias devices.

In this application, it represents a class of device that never existed before.

A Zenner diode will do a similar job at higher voltage ranges—but not with

such exceedingly low impedance.

This aspect as a super-capacitor has application in an entirely different area—on an entirely different end of the scale. More and more interest is developing in the production of ultra-intense magnetic fields—fields requiring enormous currents. Some work has been done by discharging a huge bank of condensers into a single shock blast, developing currents in the range of half a million amorers.

For the fun of it, I calculated what it would take to get a current of 1,000,000 amperes sustained for a full 60 seconds—not as a split-second discharge but as a sustained surge of power—from a bank of Nicad sintered-

plate cells.

Anyone who happens to want that megampere current can order the necessary cells off-the-shelf from Nicad. They'll all fit in a volume somewhat less than that of a standard office desk. The switching arrangement, however, may be something else again; breaking megampere currents is apt to present some problems.

The type of cell considered here, incidentally, is the standard commercial plastic-cased, hermicially-sealed Nicad sinterde-plate heavy-duty cell. The cells are relatively new—only about 5 or 6 years old—so they don't know, yet, how long the cells will last, but they have experience with these cells which were deeply, and very rapidly discharged, recharged, and recycled 2000 times . . with no loss of capacity.

So little thinking has been done on the nature and possible characteristics of batteries, actually, that many "battery experts" have never happened to

consider some of the most fundamental factors of battery design!

For example, I've found that many "experts" haven't noticed that iron is the lightest element that can be plated out of an ordinary water solution of its salts. If it weren't for iron's unfortunate habit of bubbling off hydrogen continuously, it would make iron the lightest possible material for use in a secondary cell cathode. One reason the Edison cell is so light per kilowatt hour!

The only familiar batteries have been drycells and the lead-acid storage battery; all of these have markedly limited life—inherently limited life. The lead reacts with sulfuric acid to form lead sulfate; at first the sulfate is in a microcrystalline form, but with the passage of time, the microcrystals grow into larger, though still invisibly small, crystals that will not reduce back to lead or go to lead dioxide . . . and the battery is useless.

The drycell is, necessarily, a metastable electrochemical system. Since it's a primary cell, it has to be unstable, or there could be no energy available

for use. Any battery, in its charged state, must be a metastable system.

But because we have been used to the drycell—a perfectly valid primary cell—and the lead-acid storage battery, which is always in one metastable state or another, so long as it is a battery, we've grown accustomed to

thinking "of course, it's natural for batteries to destroy themselves." It isn't; it's natural only for primary cells, and badly designed storage cells to destroy themselves. A properly designed storage cell would be an inherently stable chemical system when it was in the discharged state—and a highly metastable system in the charged state.

The Ni-Fe cell is completely stable in the discharged state; that's why it

can be stored for years at a time.

The Ni-Cd system is only slightly less stable in the discharged state; the excess cadmium metal can react slightly, very, very slowly with the nickel hydroxide, tending to drive it down from the Ni++ state to the Ni+ state—and once the nickel is in the metallic state, it will not reoxidize under the conditions of the Jungere cell's anode.

However, where the Ni-Fe cell is perfectly stable discharged, it's not as stable as it should be when charged; the iron reacts steadily with the water to give off hydrogen. You can't store a Ni-Fe cell charged, because it self-discharges. The Ni-Cd cell, however, does just what old Junger wanted—it holds its charge for years. A modern Nicad cell will retain over 30% of its charge after two years on the shelf.

The amount of research that has been expended toward getting basically new, and really effective batteries, is indicated by the complete failure of even the National Bureau of Standards to take the effort to make some actual tests on the Jungere batteries during the forty years it was successful in Europe . . . and ignored by American science and technology, because they "knew" it was a minor and unimportant variation of the Edison cell.

It wasn't a "minor" difference; it makes possible things the Ni-Fe cell simply can't approach—as those fantastically powerful little Nicad flashlight

batteries demonstrate.

The thing that licked the electric car in the early 1900's was that you couldn't recharge it in minutes, as you could the gas car. It was not lack of speed; it was at that period that an electric-powered car set that 78-mile-

an-hour automobile speed record.

Now, the objection that was raised to the gasoline car at that time is coming home to roost in a by way; they stimk. Los Angeles, all California, all big cities, are learning that fact. It's called "smog", and it's lethal. Now that more careful medical research has shown that it's not the cigarettes that cause lung cancer, but city smog, California has started passing laws to force gasoline cars to use fume-eliminators.

The Ni-Cd battery can never be a mass-production unit. Cadmium, unfortunately, can't be had! But-it does suggest what batteries could be, if

some real, honest, original research was done.

The Ni-Cd sintered plate cells can not only be discharged at fantastically

high rates—they can be charged at equally violent rates. One of those sintered-plate cells can be given 80% of a full charge in four minutes. For the larger commercial cells, with 150 ampere hour capacity, that means a charge rate of thousands of amperes, at the beginning of the charge.

Here's a battery that doesn't have the characteristics that killed the electric automobiles—it can be refilled in minutes, not hours! The Old electric cars were designed with the idea that it would have to run all day on one charge; the batteries were heavy, the motors small, and the speed slow. But suppose we have a car designed to run only two hours on a charge, and to pick up a new charge at a filling-station in a ten-minute stop? A Nicad sintered-cell battery could do it! and man! Talk about hot-rod dragsters! Think of the acceleration-torque that little starter motor in your car develops—and scale that up to a pair of twenty-horse series-wound DC drive motors powered by a battery that's happy to deliver a current of 10,000 amperes or so! And be it remembered that a series-wound DC motor has to be very carefully RPM.

But in grinning contrast to what could be done—the Edison storage battery is now owned by the "Exide" company, and, after half a century, the same design of cells remains. No effective change in half a century, It's a living fossil, embodying ideas of the period when electric power was very new, and modern metallurgical chemistry hadn't been invented.

We need electric cars—they're quite literally a matter of life and death. Electric cars that have the girup-and-go that people want—that can be used for most of the ordinary round-town work that cars are used for. And to

get that, we need some decent storage batteries.

It wasn't the Big Business Cartels that kept the Jungner battery out of

the United States; they, quite provably, had absolutely nothing to worry about, because of that no-cadmium-mine problem. It was the Big Science laziness, the failure to take the trouble to look

and see-because they "already knew" the Jungner battery was just like the

Edison, really.

And it was sheer scientific laziness that kept the Edison battery static for half a century. In some home experiments conducted to find out why the Jungner battery can throw such heavy currents, while the Edison battery is so given to fainting spells, like a belie of its birth era, when faced with a shock load, I found the answer quite simple.

Sheer bad design. The nickel anode has such high resistance, and such poor access to the electrolyte because of the method of filling, that it can't react rapidly. Naturally, I assumed at first that the difference must be that iron wouldn't hold up under heavy current, because after all the Jungner

battery uses the same essential anode reactions.

It isn't the fault of the iron; just wrapping some fine grade steel wool around a sheetiron plate gave me a test electrode that was perfectly willing to deliver 15 or 20 amperes in a 400 ml beaker-size plate! It was the inefficient Edison nickel anodes that clobbered the thing.

The high-power, high-rate, lightweight batteries we need for a hundred uses are perfectly possible. They're a real, genuine suppressed invention—bu not suppressed by what everyone always suggests as the Villains Of The Piece.

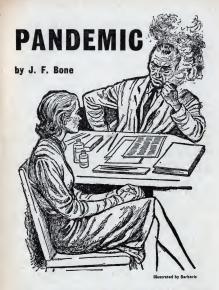
It wasn't Wall Street's fault at all-it was Ivory Tower Street.

COMPARISON OF MAJOR TYPES OF STORAGE CELLS

Characteristic	NI-Cd	Edison Ni-Fe	Lead-Acid
Weight	Moderate	Low	Heavy
Cost	High	High	Low
Service life	Decades	Decades	Months
Cost/year	Low	Low	High
Voltage/cell	1.2	1.2	2.1
Mechanically rugged?	Yes	Yes	No
Can be hermetically sealed?	Yes	No	No
Availability? *	Difficult	Difficult	Anywhere
Heavy current discharge?	Extremely	No!	Yes
Capacity available under high-rate discharge	>80%	<10%	< =40%
Damaged by repeated overcharge?	No	No	Ruined
Damaged by repeated over-discharge?	Some loss of capacity	No	Ruined
Holds charge?	2 years	2 months	2 months
Long storage (years)	Unharmed	Unharmed	Ruined unless dry
Stand temperatures above 150° F.?	Yes	Damage	Ruined
Temperatures below 0° F.?	-40°	Loss of activity below 32° F.	-60°
Water needs?	Once a year. (Non-sealed type cells)	Often	Often
Fast recharge?	Extremely fast— no damage	No!	Moderately fast— some damage

est that is offering government surplus Nicad sintered-plate

^{*} The Nicad batteries are available from the Gould-National Battery Co.'s Nicad Division—sot Gould-National battery agents don't know this! You'll have to tell them their company hanken. Or write Gould-National Battery Co., Nicad Division, 7 Dey St., New York City. Edison cells are now manufactured by the "Exide" company, and can be obtained through "Exidence of the Company. red-plate cells are getting to be fairly widely available thre te carefully that not all nickel-cadmium batteries of the se-powerful sintered-plate type; the pressed-plate type will not ha



"WE call it Thurston's Disease for two perfectly good reasons," Dr. Walter Kramer said. "He discovered it—and he was the first to die of it." The doctor fumbled fruitlessly through the pockets of his lab coat. "Now where the devil did I put those matches?"

"Are these what you're looking for?" the trim blonde in the grey seersucker uniform asked. She picked a small box of wooden safety matches from the littered lab table beside her and handed them to him. Generally, human beings don't do totally useless things consistently and widely. So—maybe there is something

to it-

"Ah," Kramer said. "Thanks. Things have a habit of getting lost around here."

"I can believe that," she said as she eyed the frenzied disorder around her. Her boss wasn't much better than his laboratory, she decided as she watched him strike a match against the side of the box and apply the flame to the charred bowl of his pipe. His long dark face became half obscured behind a cloud of bluish smoke as he puffed furiously. He looked like a lean untidy devil recently escaped from hell with his thick brows, green eyes and lank black hair highlighted intermittently by the leaping flame of the match. He certainly didn't look like a pathologist. She wondered if she was going to like working with him, and shook her head imperceptibly. Possibly, but not probably. It might be difficult being cooped up here with him day after day. Well, she could always quit if things got too tough. At least there was that consolation.

that consolation.

He draped his lean body across a lab stool and leaned his elbows on its back. There was a faint smile on his face as he eyed her quizzically. "You're new," he said. "Not just to this lab but to the Institute."

She nodded. "I am, but how did you know?"

"Thurston's Disease. Everyone in the Institute knows that name for the plague, but few outsiders do." He smiled sardonically, "Virus pneumonic plague—that's a better term for public use. After all, what good does it do to advertise a doctor's stupidity?"

She eyed him curiously. "De mortuis?" she asked.

He nodded. "That's about it. We may condemn our own, but we don't like laymen doing it. And besides, Thurston had good intentions. He never dreamed this would happen."

"The road to hell, so I hear, is paved with good intentions."

"Undoubtedly," Kramer said dryly. "Incidentally, did you apply for this job or were you assigned?"

"I applied."

"Someone should have warned you I dislike clichés," he said. He paused a moment and eyed her curiously. "Just why did you apply?" he asked. "Why are you imprisoning yourself in a sealed laboratory which you won't leave as long as you work here. You know, of course, what the conditions are. Unless you resign or are carried out feet first you will remain here have you considered what such an imprisonment means?"

"I considered it," she said, "and it doesn't make any difference, I have no ties outside and I thought I could help. I've had training. I was a nurse before I was married."

"Divorced?"

"Widowed."

Kramer nodded. There were plenty of widows and widowers outside.

Too many. But it wasn't much worse than in the Institute where, despite precautions, Thurston's disease took its toll of life.

"Did they tell you this place is called the suicide section?" he asked.

She nodded.

"Weren't you frightened?"

"Of dying? Hardly. Too many people are doing it nowadays."

He grimaced, looking more satanic than ever. "You have a point," he admitted, "but it isn't a good one. Young people should be afraid of dying." "You're not."

"I'm not young. I'm thirty-five, and besides, this is my business. I've been looking at death for eleven years. I'm immune."

"I haven't your experience," she admitted, "but I have your attitude."

"What's your name?" Kramer said.

"Barton, Mary Barton."

"Hm-m.m. Well, Mary—I can't turn you down. I need you. But I could wish you had taken some other job."

"I'll survive."

He looked at her with faint admiration in his greenish eyes. "Perhaps you will," he said. "All right. As to your duties—you will be my assistant, which means you'll be a dishwasher, laboratory technician, secretary, junior pathologist, and coffee maker. I'll help you with all the jobs except the last one. I make lousy coffee." Kramer grinned, his teeth a white flash across the darkness of his face. "You'll be on call twenty-four hours a day, underpaid, overworked, and in constant danger until we lick Thurston's virus. You'll be expected to handle the jobs of three people unless I can get more help—and I doubt that I can. People stay away from here in droves. There's no future in it."

Mary smiled wryly. "Literally or figuratively?" she asked.

He chuckled. "You have a nice sense of graveyard humor," he said.

"It'll help. But don't get careless. Assistants are hard to find."

She shook her head, "I won't. While I'm not afraid of dying I don't want

to do it. And I have no illusions about the danger. I was briefed quite thoroughly."

"They wanted you to work upstairs?"

She nodded.

"I suppose they need help, too. Thurston's Disease has riddled the medical profession. Just don't forget that this place can be a death trap. One mistake and you've had it. Naturally, we take every precaution, but with a virus no protection is absolute. If you're careless and make errors in procedure, sooner or later one of those submicroscopic protein molecules will get into your system."

"You're still alive."

"So I am," Kramer said, "but I don't take chances. My predecessor, my secretary, my lab technician, my junior pathologist, and my dishwasher all died of Thurston's Disease." He eyed her grimly. "Still want the job?" he asked.

"I lost a husband and a three-year-old son," Mary said with equal grimness. "That's why I'm here. I want to destroy the thing that killed my family. I want to do something. I want to be useful." He nodded. "I think you can be," he said quietly.

"Mind if I smoke?" she asked. "I need some defence against that pipe of yours."

"No—go ahead. Out here it's all right, but not in the security section."

Mary took a package of cigarettes from her pocket, lit one and blew a

cloud of grey smoke to mingle with the blue haze from Kramer's pipe.

"Comfortable?" Kramer asked.

Sne nodded

He looked at his wrist watch. "We have half an hour before the roll tube cultures are ready for examination. That should be enough to tell you about the modern Pasteur and his mutant virus. Since your duties will primarily involve Thurston's Disease, you'd better know something about it." He settled himself more comfortably across the lab bench and went on talking in a dry schoolmasterish voice. "Alan Thurston was an immunologist at Midwestern University Medical School. Like most men in the teaching trade, he also had a research project. If it worked out, he'd be one of the great names in medicine, like Jenner, Pasteur, and Salk. The result was that he pushed it and wann't too careful. He wanted to be famous."

"He's well known now," Mary said, "at least within the profession."

"Quite," Kramer said dryly. "He was working with gamma radiations on micro-organisms, trying to produce a mutated strain of Micrococcus pyogenes that would have enhanced antigenic properties."

"Wait a minute, doctor. It's been four years since I was active in nursing.

Translation, please."

Kramer chuckled. "He was trying to make a vaccine out of a common infectious organism. You may know it better as Staphylococcus. As you know, it's a pus former that's made hospital life more dangerous than it should be because it develops resistance to antibiotics. What Thurston wanted to do was to produce a strain that would stimulate resistance in the patient without causing disease—something that would help patients protect themselves rather than rely upon doubfully effective antibiotics."

That wasn't a bad idea."

"There was nothing wrong with it. The only trouble was that he wound up with something else entirely. He was like the man who wanted to make a plastic suitable for children's toys and ended up with a new explosive. You see, what Thurston didn't realize was that his cultures were contaminated. He'd secured them from the University Chinic and had, so be thought, iso-lated them. But somehow he'd brought a virus along—probably one of the orphan group or possibly a phase."

"Orphan?"

"Yes—one that was not a normal inhabitant of human tissues. At any ravelene was a virus—and he muisted if rather than the bacteria. Actually, it was simple enough, relatively speaking, since a virus is infinitely simpler in structure than a bacterium, and hence much easier to modify with ionizing radiation. So be didn't produce an antigen—he produced a dissesse instead. Naturally, he contacted it, and during the period between his infection and death he managed to infect the entire hospital. Before anyone realized what they were dealing with, the disease jumped from the hospital to the college, and from the college to the city, and from the city to—"

"Yes, I know that part of it. It's all over the world now-killing people by the millions."

"Well," Kramer said, "at least it's solved the population explosion." He blew a cloud of blue smoke in Mary's direction. "And it did make Thurston famous. His name won't be quickly forgotten."

She coughed. "I doubt if it ever will be," she said, "but it won't be remembered the way he intended."

He looked at her suspiciously. "That cough-"

"No, it's not Thurston's Disease, It's that pipe, It's rancid."

"It helps me think," Kramer said.

"You could try cigarettes-or candy," she suggested.

"I'd rather smoke a pipe."

"There's cancer of the lip and tongue," she said helpfully.
"Don't quote Ochsner. I don't agree with him. And besides, you smoke cigarettes, which are infinitely worse.'

'Only four or five a day. I don't saturate my system with nicotine." "In another generation," Kramer observed, "you'd have run through the

streets of the city brandishing an ax smashing saloons. You're a lineal descendant of Carrie Nation." He puffed quietly until his head was surrounded by a nimbus of smoke. "Stop trying to reform me," he added. "You haven't been here long enough."

"Not even God could do that, according to the reports I've heard," she said.

He laughed. "I suppose my reputation gets around."

"It does. You're an opinionated slave driver, a bully, an intellectual tyrant,

and the best pathologist in this center."

"The last part of that sentence makes up for the unflattering honesty of the first," Kramer said. "At any rate, once we realized the situation we went to work to correct it. Institutes like this were established everywhere the disease appeared for the sole purpose of examining, treating, and experimenting with the hope of finding a cure. This section exists for the evaluation of treatment. We check the human cases, and the primates in the experimental laboratories. It is our duty to find out if anything the boys upstairs try shows any promise. We were a pretty big section once, but Thurston's virus has whittled us down. Right now there is just you and me. But there's still enough work to keep us busy. The experiments are still going on, and there are still human cases, even though the virus has killed off most of the susceptibles. We've evaluated over a thousand different drugs and treatments in this Institute alone.

"And none of them have worked?"

"No-but that doesn't mean the work's been useless. The research has saved others thousands of man hours chasing false leads. In this business negative results are almost as important as positive ones. We may never discover the solution, but our work will keep others from making the same mistakes "

"I never thought of it that way."

"People seldom do. But if you realize that this is international, that every worker on Thurston's Disease has a niche to fill, the picture will be clearer. We're doing our part inside the plan. Others are, too. And there are thousands of labs involved. Somewhere, someone will find the answer. It probably won't be us, but we'll help get the problem solved as quickly as possible. That's the important thing, It's the biggest challenge the race has ever faced—and the most important. It's a question of survival." Kramer's voice was sober. "We have to solve this. If Thurston's Disease isn't checked, the human race will become extinct. As a result, for the first time in history all mankind is working toeether."

"All? You mean the Communists are, too?"

"Of course. What's an ideology if there are no people to follow it?" Kramer knocked the ashes out of his pipe, looked at the laboratory clock and shrugged. "Ten minutes more," he said, "and these tubes will be ready. Keep an eye on that clock and let me know. Meantime you can straighten up this lab and find out where things are. I'll be in the office checking the progress reports." He turned abruptly away, leaving her standing in the middle of the cluttered laboratory.

"Now what am I supposed to do here?" Mary wondered aloud. "Clean up, he says. Find out where things are, he says. Get acquainted with the place, he says. I could spend a month doing that." She looked at the littered bench, the wall cabinets with sliding doors half open, the jars of reagents sitting on the sink, the drainboard, on top of the refrigerator and on the floor. The disorder was appalling. "How he ever manages to work in here is beyond me. I suppose that I'd better start somewhere—perhaps I can get these bottles in some sort of order first." She sighed and moved toward the wall cabinets. "Oh well." she mused, "I asked for this."

"Didn't you hear that buzzer?" Kramer asked.

"Was that for me?" Mary said, looking up from a pile of bottles and glassware she was sorting.

"Partly. It means they've sent us another post-mortem from upstairs."

"What is it?"

"I don't know—man or monkey, it makes no difference. Whatever it is, it's Thurston's Disease. Come along. You might as well see what goes on in our ultra modern necropsy suite."

"I'd like to." She put down the bottle she was holding and followed him

to a green door at the rear of the laboratory.

"Inside," Kramer said, "you will find a small antercom, a shower, and a dressing room. Strip, shower, and put on a clean set of lab coveralls and slippers which you will find in the dressing room. You'll find surgical masks in the wall cabinet beside the lockers. Go through the door beyond the dressing room and wait for me there. I'll give you ten minutes.

"We do this both ways," Kramer said as he joined her in the narrow hall beyond the dressing room. "We'll reverse the process going out."

"You certainly carry security to a maximum," she said through the mask

that covered the lower part of her face.

"You haven't seen anything yet," he said as he opened a door in the hall.
"Note the positive air pressure," he said. "Theoretically nothing can get in here except what we bring with us. And we try not to bring anything." He stood asside to show her the glassed-in cubicle overhanging a bare room dominated by a polished steel post-mortent table that glittered in the harsh

fluorescent lighting. Above the table a number of jointed rods and clamps hung from the ceiling. A low metal door and series of racks containing instruments and glassware were set into the opposite wall together with the

gaping circular orifice of an open autoclave.

"We work by remote control, just like they do at the AEC. See those handlers?" He pointed to the control console set into a small stainless sted table standing beside the sheet of glass at the far end of the cubicle. "They're connected to those gadgets up there." He indicated the jointed arms hanging over the autopsy table in the room beyond. "It ould perform a major operation from here and never touch the patient. Using these I can do anything I could in person with the difference that there's a quarter inch of glass between me and my work. I have controls that let me use magnifiers, and even do microdissection, if necessary."

"Where's the cadaver?" Mary asked.

"Across the room, behind that door," he said, waving at the low, sliding metal partition behind the table. "It's been prepped, decontaminated and ready to go."

"What happens when you're through?"

"Watch." Dr. Kramer pressed a button on the console in front of him. A section of flooring slid aside and the table tipped. "The cadaver slides off that table and through that hole. Down below is a highly efficient crematorium."

Mary shivered. "Neat and effective," she said shakily.

"After that the whole room is sprayed with germicide and sterilized with live steam. The instruments go into the autoclave, and thirty minutes later

we're ready for another post-mortem."

"We use the handlers to put specimens into those jars," he said, pointing to a row of capped glass jars of assorted sizes on a swill rack behind the table. "After they're capped, the jars go onto that carrier beside the table. From here they pass through a decontamination chamber and into the remote-control laboratory across the hall where we can run biochemical and histological techniques. Finished slides and mounted specimens then go through another decontamination process to the outside lab. Theoretically, this place is proof against anything."

"It seems to be," Mary said, obviously impressed. "I've never seen any-

thing so elegant.'

"Neither did I until Thurston's Disease became a problem." Kramer shrugged and sat down behind the controls. "Watch, now," he said as he pressed a button. "Let's see what's on deck—man or monkey. Want to make a bet? I'll give you two to one it's a monkey."

She shook her head.

The low door slid aside and a steel carriage emerged into the necropsy room bearing the nude body of a man. The coprse gleamed pallidly under the harsh shadowless glare of the fluorescents in the ceiling as Kramer, using the handlers, rolled it not to the post-mortent nable and clamped it in place on its back. He pushed another button and the carriage moved back into the wall and the steel door slid shut. "That"l be decontaminated," he said, "and sent back upstairs for another body. I'd have lost," he remarked idly. "Lately the posts have been running three to one in favor of monkeys."

He moved a handler and picked up a heavy scalpel from the instrument rack. "There's a certain advantage to this," he said as he moved the handler delicately. "These gadgets give a tremendous mechanical advantage. I can

cut right through small bones and cartilage without using a saw."
"How nice," Mary said. "I expect you enjoy yourself."

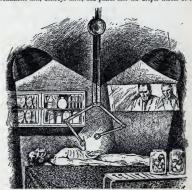
"I couldn't ask for better equipment," he replied noncommittally. With deft motion of the handler he drew the scalpel down across the chest and along the costal margins in the classic inverted "Y" incision. "We'll take a look at the thorax first," he said, as he used the handlers to pry open the rib cage and expose the thoracie viscora. "Ahl Thought sof See that?" He pointed with a small handler that carried a probe. "Look at those lungs." He swung a viewer into place so Mary could see better. "Look at those abscesses and

a viewer into place so Mary could see better. "Look at those abscesses and necrosis. It's Thruston's Disease, all right, with secondary bacterial invasion." The grayish solidified masses of tissue looked nothing like the normal pink appearance of healthy lungs. Studded with vellowish spherical abscesses.

they lay swollen and engorged within the gaping cavity of the chest.
"You know the pathogenesis of Thurston's Disease?" Kramer asked.

Mary shook her head, her face yellowish-white in the glare of the fluorescents.

"It begins with a bronchial cough," Kramer said. "The virus attacks the bronchioles first, destroys them, and passes into the deeper tissues of the



lungs. As with most virus diseases there is a transitory leukopenia—a drop in the total number of white blood cells—and a rise in temperature of about two or three degrees. As the virus attacks the alveolar structures, the temperature rises and the white blood cell count becomes elevated. The lungs become inflamed and painful. There is a considerable quantity of lymphoid exudate and pleural effusion. Secondary invaders and pus-forming bacteria follow the vital destruction of the lung tissue and form abscesses. Breathing becomes progressively more difficult as more lung tissue is destroyed. Hepatization and necrosis inactivate more lung tissue as the bacteria get in their dirty work, and finally the patient suffocates."

"But what if the bacteria are controlled by antibiotics?"

"Then the virus does the job. It produces attelectasis followed by progressive necrosis of lung tissue with gradual liquefaction of the parenchyma. It's slower, but just as fatal. This fellow was lucky. He apparently stayed out of here until he was almost deed. Probably he's had the disease for about a week. If he'd have come in early, we could have kept him alive for maybe a month. The end, however, would have been the same."

"It's a terrible thing," Mary said faintly.

"You'll get used to it. We get one or two every day." He shrugged. "There's nothing here that's interesting." he said as he released the clamps and tilted the table. For what seemed to Mary an interminable time, the cadaver clung to the polished steel. Then abruply it sild off the shining surface and disappeared through the square hole in the floor. "We'll clean up now," Kramer said as he placed the instruments in the autoclave, closed the door and locked it, and pressed three buttons on the consolo.

From jets embedded in the walls a fine spray filled the room with fog. "Germicide," Kramer said. "Later, there'll be steam. That's all for now. Do you want to go?"

Mary nodded.

"If you feel a little rocky there's a bottle of Scotch in my desk. I'll split a drink with you when we get out of here."

"Thanks," Mary said. "I think I could use one."

"Barton! Where is the MacNeal stain!" Kramer's voice came from the lab. "I left it on the sink and it's gone!"

"It's with the other blood stains and reagents. Second drawer from the right in the big cabinet. There's a label on the drawer." Mary called from the office. "If you can wait until I finish filing these papers, I'll come in and help you."

"I wish you would," Kramer's voice was faintly exasperated. "Ever since you've organized my lab I can't find anything."

"You just have a disorderly mind," Mary said, as she slipped the last paper into its proper folder and closed the file. "I'll be with you in a minute."

"I don't dare lose you," Kramer said as Mary came into the lab. "You've made yourself indispensable. It'd take me six months to undo what you've done in one. Not that I mind," he amended, "but I was used to things the way they were." He looked around the orderly laboratory with a mixture

of pride and annoyance. "Things are so neat they're almost painful."

"You look more like a pathologist should," Mary said as she deftly removed the tray of blood slides from in front of him and began to run the stains. "It's my job to keep you free to think."

"Whose brilliant idea is that? Yours?"

"No-the Director's. He told me what my duties were when I came here. And I think he's right. You should be using your brain rather than fooling around with blood stains and sectioning tissues."

'But I like to do things like that," Kramer protested. "It's relaxing."

"What right have you to relax," Mary said. "Outside people are dying by the thousands and you want to relax. Have you looked at the latest mortality reports?"

"No-"

"You should. The WHO estimates that nearly two billion people have died since Thurston's Disease first appeared in epidemic proportions. That's two out of three. And more are dying every day. Yet you want to relax.'

"I know," Kramer said, "but what can we do about it. We're working

but we're getting no results."

"You might use that brain of yours," Mary said bitterly, "You're supposed to be a scientist. You have facts. Can't you put them together?"

"I don't know," He shrugged, "I've been working on this problem longer

than you think. I come down here at night-"

"I know. I clean up after you."

"I haven't gotten anywhere. Sure, we can isolate the virus. It grows nicely on monkey lung cells. But that doesn't help. The thing has no apparent antigenicity. It parasitizes, but it doesn't trigger any immune reaction. We can kill it, but the strength of the germicide is too great for living tissue to tolerate."

"Some people seem to be immune."

"Sure they do-but why?"

"Don't ask me. I'm not the scientist."

"Play like one," Kramer growled. "Here are the facts. The disease attacks people of all races and ages. So far every one who is attacked dies. Adult Europeans and Americans appear to be somewhat more resistant than others on a population basis. Somewhere around sixty per cent of them are still alive, but it's wiped out better than eighty per cent of some groups. Children get it worse. Right now I doubt if one per cent of the children born during the past ten years are still alive."

"Ît's awful!" Mary said.

"It's worse than that, It's extinction. Without kids the race will die out." Kramer rubbed his forehead.

"Have you any ideas?"

"Children have less resistance," Kramer replied, "An adult gets exposed to a number of diseases to which he builds an immunity. Possibly one of these has a cross immunity against Thurston's virus."

"Then why don't you work on that line?" Mary asked.

"Just what do you think I've been doing? That idea was put out months ago, and everyone has been taking a crack at it. There are twenty-four laboratories working full time on that facet and God knows how many more working part time like we are. I've screened a dozen common diseases,

including the six varieties of the common cold virus. All, incidentally, were negative.

"Well-are you going to keep on with it?" "I have to." Kramer rubbed his eyes. "It won't let me sleep. I'm sure we're on the right track. Something an adult gets gives him resistance or immunity." He shrugged. "Tell you what. You run those bloods out and I'll go take another look at the data." He reached into his lab coat and produced

a pipe. "I'll give it another try."

Sometimes I wish you'd read without puffing on that thing," Mary said. "Your delicate nose will be the death of me vet-" Kramer said.

"It's my lungs I'm worried about," Mary said. "They'll probably look like two pieces of well-tanned leather if I associate with you for another year."

'Stop complaining. You've gotten me to wear clean lab coats. Be satisfied with a limited victory," Kramer said absently, his eyes staring unseeingly at a row of reagent bottles on the bench. Abruptly he nodded, "Fantastic," he muttered, "but it's worth a check." He left the room, slamming the door behind him in his hurry.

"That man!" Mary murmured. "He'd drive a saint out of his mind. If I wasn't so fond of him I'd quit. If anyone told me I'd fall in love with a pathologist, I'd have said they were crazy. I wish-" Whatever the wish was, it wasn't uttered. Mary gasped and coughed rackingly. Carefully she moved back from the bench, opened a drawer and found a thermometer. She put it in her mouth. Then she drew a drop of blood from her forefinger and filled a red and white cell pipette, and made a smear of the remainder. She was interrupted by another spasm of coughing, but she waited until

the paroxysm passed and went methodically back to her self-appointed task. She had done this many times before. It was routine procedure to check on anything that might be Thurston's Disease. A cold, a sore throat, a slight difficulty in breathing-all demanded the diagnostic check. It was as much a habit as breathing. This was probably the result of that cold she'd gotten last week, but there was nothing like being sure. Now let's see-temperature 99.5 degrees, red cell count 41 million. White cell count . . . oh! 2500 . . . leukopenia! The differential showed a virtual absence of polymorphs, lymphocytes and monocytes. The whole slide didn't have two hundred. Eosinophils and basophils way up-twenty and fifteen per cent respectively-a relative rise rather than an absolute one-leukopenia, no doubt about it.

She shrugged. There wasn't much question. She had Thurston's Disease. It was the beginning stages, the harsh cough, the slight temperature, the leukopenia. Pretty soon her white cell count would begin to rise, but it would rise too late. In fact, it was already too late. It's funny, she thought. I'm going to die, but it doesn't frighten me. In fact, the only thing that bothers me is that poor Walter is going to have a terrible time finding things. But

I can't put this place the way it was. I couldn't hope to.

She shook her head, slid gingerly off the lab stool and went to the hall door. She'd better check in at the clinic, she thought. There was bed space in the hospital now. Plenty of it. That hadn't been true a few months ago but the only ones who were dying now were the newborn and an occasional adult like herself. The epidemic had died out not because of lack of virulence but because of lack of victims. The city outside, one of the first affected, now had less than forty per cent of its people left alive. It was a hollow shell of its former self. People walked its streets and went through the motions of life. But they were not really alive. The vital criteria were as necessary for a reas for an individual. Growth, reproduction, irritability, metabolism— Mary smiled wryly, Whoever had authored that hackneyed memonic that life was a "grim" proposition never knew how right he was, particularly when one of the criteria was missing.

The race couldn't reproduce. That was the true horror of Thurston's Disease—not how it killed, but who it killed, No children played in the parks and playgrounds. The schools were empty. No babies were pushed in carriages or taken on tours through the supermarkets in shopping carrs. No advertisements of motherhood, or children, or children's things were in the newspapers or magazines. They were forbidden subjects—too dangerously emotional to touch. Laughter and shrill young voices had vanished from the earth to be replaced by the drab gayness of silence and waiting. Death had laid cold hands upon the hearts of mankind and the survivors were frozen to numbness.

It was odd, she thought, how wrong the prophets were. When Thurston's Dissass broke into the news there were frightened predictions of the end of civilization. But they had not materialized. There were no mass insurrections, no rioting, no organized violence. Individual excesses, yes—but nothing of a group nature. What little panic there was at the beginning disappeared once people realized that there was no place to go. And a grim passivity had settled upon the survivors. Civilization did not break down. It endured. The mechanisz remained intact. People had to do something even if it was only routine counterfeit of normal life—the stiff upper lip in the face of disaster.

It would have been far more odd, Mary decided, if mankind had given way to panic. Humanity had survived other plagues nearly as terrible as this—and racial memory is long. The same grim patience of the past was here in the present. Man would somehow survive, and civilization go on.

It was inconceivable that mankind would become extinct. The whole vast resources and pooled intelligence of surviving humanity were focused upon Thurston's Disease. And the disease would yield. Humanity waited with childlike confidence for the miracle that would save it. And the miracle would happen. Mary knew it with a calm certainty as she stood in the cross corridor at the end of the hall, looking down the thirty yards of tile that separated her from the elevator that would carry her up to the clinic and oblivion. It might be too late for her, but not for the race. Nature had tried unaided to destroy man before—and had failed. And her unholy alliance with man's genuius would also fail.

She wondered as she walked down the corridor if the others who had sickened and died felt as she did. She speculated with grim amusement whether Walter Kramer would be as impersonal as he was with the others when he performed the post-mortem on her body. She shivered at the thought of that bare sterile room and the shining table. Death was not a pretty thing. But she could meet it with resignation if not with courage. She had already seen too much for it to have any meaning. She did not falter as she explaced a finger on the elevator button.

Poor Walter—she sighed. Sometimes it was harder to be among the living. It was good that she didn't let him know how she felt. She had sensed a change in him recently. His friendly impersonality had become merely friendly. It could, with a little encouragement, have developed into something else. But it wouldn't now. She sighed again. His hardness had been a tower of strength. And his bitter gallows humor had furnished a way retief to grim reality. It had been nice to work with him. She wondered if he would miss her. Her lips curled in a faint smile. He would, if only for the trouble he would have in making chaos out of the order she had created. Why couldn't that elevator hurry?

"Mary! Where are you going?" Kramer's voice was in her ears, and his hand was on her shoulder.

"Don't touch me!"

"Why not?" His voice was curiously different. Younger, excited. "I have Thurston's Disease," she said.

He didn't let go. "Are you sure?"

"The presumptive tests were positive."

"Initial stages?"

She nodded. "I had the first coughing attack a few minutes ago."

He pulled her away from the elevator door that suddenly slid open. "You were going to that death trap upstairs," he said.

"Where else can I go?"

"With me," he said. "I think I can help you."
"How? Have you found a cure for the virus?"

"I think so. At least it's a better possibility than the things they're using up there." His voice was urgent. "And to think I might never have seen it

if you hadn't put me on the track."
"Are you sure you're right?"

"Not absolutely, but the facts fit. The theory's good."

"Then I'm going to the clinic. I can't risk infecting you. I'm a carrier now. I can kill you, and you're too important to die."

"You don't know how wrong you are," Kramer said.
"Let go of me!"

Let go of me!

"No-you're coming back!"

She twisted in his grasp. "Let me go!" she sobbed and broke into a fit of coughing worse than before.
"What I was trying to say," Dr. Kramer said into the silence that followed,

"is that if you have Thurston's Disease, you've been a carrier for at least two weeks. If I am going to get it, your going away can't help. And if I'm not, I'm not."

"Do you come willingly or shall I knock you unconscious and drag you back?" Kramer asked.

She looked at his face. It was grimmer than she had ever seen it before. Numbly she let him lead her back to the laboratory.

"But, Walter—I can't. That's sixty in the past ten hours!" she protested. "Take it," he said grimly, "then take another. And inhale. Deeply."

"But they make me dizzy."

"Better dizzy than dead. And, by the way-how's your chest?"

"Better. There's no pain now. But the cough is worse."

"It should be."

"Why?"

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"You've never smoked enough to get a cigarette cough," he said. She shook her head dizzily, "You're so right," she said.

"And that's what nearly killed you," he finished triumphantly.

"Are you sure?"

"I'm certain. Naturally, I can't prove it-yet. But that's just a matter of time. Your response just about clinches it. Take a look at the records. Who gets this disease? Youngsters-with nearly one hundred per cent morbidity and one hundred per cent mortality. Adults-less than fifty per cent morbidity -and again one hundred per cent mortality. What makes the other fifty per cent immune? Your crack about leather lungs started me thinking-so I fed the data cards into the computer and keyed them for smoking versus incidence. And I found that not one heavy smoker had died of Thurston's Disease. Light smokers and nonsmokers-plenty of them-but not one single nicotine addict. And there were over ten thousand randomized cards in that spot check. And there's the exact reverse of that classic experiment the lung cancer boys used to sell their case. Among certain religious groups which prohibit smoking there was nearly one hundred per cent mortality of all ages!

"And so I thought since the disease was just starting in you, perhaps I could stop it if I loaded you with tobacco smoke. And it works!

"You're not certain yet," Mary said. "I might not have had the disease."

"You had the symptoms. And there's virus in your sputum."

"Yes, but--"

"But, nothing! I've passed the word-and the boys in the other labs figure that there's merit in it. We're going to call it Barton's Therapy in your honor. It's going to cause a minor social revolution. A lot of laws are going to have to be rewritten. I can see where it's going to be illegal for children not to

smoke, Funny, isn't it?

"I've contacted the maternity ward. They have three babies still alive upstairs. We get all the newborn in this town, or didn't you know, Funny, isn't it, how we still try to reproduce. They're rigging a smoke chamber for the kids. The head nurse is screaming like a wounded tiger, but she'll feel better with live babies to care for. The only bad thing I can see is that it may cut down on her chain smoking. She's been worried a lot about infant mortality.

"And speaking of nurseries—that reminds me. I wanted to ask you

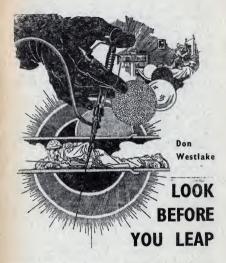
something. "Yes?"

"Will you marry me? I've wanted to ask you before, but I didn't dare. Now I think you owe me something-your life. And I'd like to take care of it from now on."

"Of course I will," Mary said. "And I have reasons, too. If I marry you, you can't possibly do that silly thing you plan."

"What thing?"

"Naming the treatment Barton's. It'll have to be Kramer's."



THE third day of bivouac Jeremy got so scared he went home. Just like that. And that scared him so much, he went right back. And then he spent a few days thinkine about it.

Jeremy knew that it had been an hallucination. They were on bivouac, on night problem, with the tear gas bombs bursting in air, and everybody whispering, "Gas!", and the concealed Tactical Instructors having flun with rifle shots and flares and things that went bump in the night, Jeremy was one of a long line of basic trainees crawing through a pitch-black dry drainage pipe, the curved roughness of the pipe magnifying the sounds from

outside. A couple of TI's had dropped tear gas bombs at either end of the pipe, and the whispered warnings-"Gas!"-had echoed forward and back toward Jeremy, in the middle of the pipe.

By this time, Jeremy was just about as frightened as he could possibly be anyway. And then he heard the whispers, and he pulled off his fatigue cap with one hand, and his glasses with the other hand, and that didn't leave

any hands for the gas mask.

He skittered frantically, all crouched and cramped in the pipe, trying to hold cap and glasses in one hand and put the gas mask on with two hands, and it was pitch-black so he couldn't see a thing, and then he dropped the gas mask, and couldn't find it.

And the first whiff of tear gas reached him,

And he could feel the young terror of all the other basic trainces in the pipe, reduced to harried sewer-crawling by a world they never made.

One second, there he was in the pipe, his heart pounding like a jack hammer. The next second, he was huddled over on hands and knees aton his own bed at home. The bedroom door was open, and soft light filtered up from the living room downstairs, and he could recognize his room, his bed, his desk, the full-length mirror on the closet door, the painting of a collie hanging on the wall over the bureau. I'm crazy! he thought wildly.

And the next second, he was back in the pipe in the miserable dark, hands fumbling for the gas mask. He found it, and got it on at last, and the people behind him were pushing and swearing. He crawled through the pipe and

ran with the rest.

Colonel Brice stood on the road across the ravine, watching the scurrying basic trainees down below, and wondering whether there'd be one in this group or not. He watched the TI's drop their tear gas bombs down toward the entrances of the drainage pipe, listening to the crash and boom of the combat simulation from up and down the length of the ravine, and he hoped

there would be one. There wasn't any reason for this, otherwise.

He wondered how much longer he could fight modernization on this front. He had the older staff officers on his side, of course; none of them would ever really believe in their heart of hearts that the every-man-a-rifleman-first concept was obsolescent now. But there were younger men coming up, men who realized that this week of bivouac was a farce, that its only result was to terrify, anger, and occasionally maim the basic trainees. The vast majority of Air Force enlisted men were going to be clerks or technicians, in support of the airplanes and missiles which were the actual combat arm. Besides, reducing the sixteen weeks of Army basic training to a five-day bivouac was, at the least, overly optimistic,

Thank heaven, the colonel thought, for the military mind. Or is that a contradiction in terms? But, at any rate, as long as the military mind retains its basic qualities of blind unadaptability, every single enlisted man in the Air Force would go through this bivouac: Colonel Brice's field experiment. And if they phase out the bivouac, he thought, I'll just have to find some

other way to screen these people. The colonel looked up at the control shack just in time to see the door

open and Ed Clark stick his head out to speak to the runner.

They've found someone! he thought, and started for the control shack,

not waiting for the runner to come down to him. Behind him, the TT's with the tear gas bombs looked after him, and then glanced at one another and shrugged. Neither of them knew where Colonel Brice fit into the general scheme of things. No one seemed to know. But he was always there, every week, every Wednesday night, to watch the night problem.

The runner met the colonel halfway up the slope. "Mr. Clark wants to see you, sir," he said.

"I know," said the colonel. "Thank you."

"Yes, sir."

The colonel held in the smile he felt tugging at his lips. The runner was so frankly curious. Only three people on this base were allowed into the control shack, or knew what went on in there. The colonel himself, and Ed Clark, and Paul Swanson. Not even Lieutenant general Poole, the base commander, knew anything about the colonel and his two assistants, and not even he was allowed inside the control shack, a fact which pleased the good general not at all.

There was no way to open the door from the outside. The colonel knocked, and Ed Clark pushed the door open for him. "Come on in, sir," he said.

"We've got a real dilly this time."

The colonel stepped into the shack and closed the door, glancing at Clark

and Paul Swanson, scated over by the TV screen.

The three men were of decided types. Colonel James Brice, tall and lean in his blue uniform, was square-jawed and thin-lipped, his brown eyes deep set beneath shagey brows, his gray hair cropped close to his skull. Before the Second World War, he had been an anthropologist, associated with a New England university. He had learned to fiy a plane, since there were some areas of the world which could be reached by no other kind of vehicle, and when the war had come along he had wound up in the Army Air Corps. He had stayed in the service, switching over to the new-born Air Force in 1947, and settled into Intelligence in 1949.

Ed Clark was twenty-six and looked ten years younger. His boyish, cheerful face was topped by pale blond hair in the inevitable crewert. He was tall and slender, looking exactly like a first-string center on a high school basketbalt team. He was wearing tan slacks and a short-sleeved white shirt, open at the collar. He and Paul Swanson were both enlisted men, and took the prerogative given Intelligence personnel to wear civilian clothing. The base finance officer was the only individual on the base outside this room who knew their ranks. They sirred only Colonel Brice, and were called

Mister by both enlisted men and officers on the base.

Paul Swanson was short and wiry, black-haired and full-lipped. He was twenty-three, and looked five years older. He came originally from New York City, and no one could have mistaken his place of origin. Dressed now in black trousers and a pale-green shirt, he glumly watched the dim figures moving across the television screen, piped up from the infra-red camera concealed in the drainage pipe down at the ravine.

The colonel looked at the TV screen for a second, then looked back at Ed Clark. "What is it this time?" he asked.

"I'm not sure," Clark admitted. "We did get a picture of him, though, so we'll be able to identify him."

"Well, what did he do?" asked the colonel.

It was Paul Swanson who answered. "He disappeared."

"He did what?"

"It was just for a second," Swanson went on. "I almost missed it, it was softs. But he just up and disappeared. And then, a second later, he came right back again."

"Disappeared," mused the colonel. "Invisibility? That one I don't go for. You don't just suddenly change your entire body chemistry to glass."

"He did it," said Swanson simply.

"He learned it in the Orient," suggested Clark. "The mysterious power to cloud men's minds."

"Cloud men's minds, maybe," said the colonel. "Cloud an infra-red television camera, never. Particularly when you don't know it's there."

"Maybe he did," said Swanson.

"A telepath?" The colonel brightened. If that's what it is, at last—but why the disappearing act?" He turned to Swanson. "What was his reaction to it? How did he act after he'd done it? Guilty, pleased with himself, or what?"

"Scared to death," said Swanson, "I don't think he'd planned on doing it. He just got rattled, and did it."

"So what do we do now?" asked Clark.

"Sit and wait," said the colonel, "identify him, and keep an eye on him. But there's no sense approaching him until we find out exactly what it is he's doing and what his attitude toward it all is." The colonel glanced at the TV screen again. The basic trainers were still crawing hurriedly through the drainage pipe, the line pausing intermittently to hurriedly don gas masks and then craw!

"He disappeared," said the colonel softly, and shook his head.

It wasn't until the next day that things slowed down enough for Jeremy to think about what had happened in the drainage pipe. That afternoon, he sat on the sunlit grass with the rest of the basic trainees in his flight, and listened to a man in pressed fatigues explain the principles of the earbine. Then he had time to think. And to get scarced all over again.

It had been an hallucination, It must have been an hallucination, there

was no other way to explain it.

He worried and fretted and chewed his thumb-knuckle all aftermoon, and by nightfall he had himself convinced. Never mind the clarity and reality of that scene, the feel of the texture of the bedspread beneath his hands, or how accurately he had seen himself reflected in the closet mirror. Home was seven hundred miles away.

He had not gone home. It had been an hallucination.

He convinced himself at last, and for three days he stayed convinced.

And then he got the letter from his mother.

The letter itself was simply one of the newsy, chatty notes he had come to expect from his mother in his seven weeks in the Air Force. But one sentence in it stood out as though it were written in fire.

The sentence concerned Jeremy's dog, Andrew. "I thought at last we'd broken Andrew of the habit of sleeping on your bed," his mother wrote, "but

last night he did it again, leaving muddy marks all over the bedspread. He

was gone, of course, by the time I got there."

Two days later, bivouac being over and the flight back at the barracks, Jeremy went on sick call. To the man-with-clipboard who marched the sick call group to the infirmary, he said, "I'm having hallucinations." To the white-garbed medic who questioned him at the infirmary, he said, "I'm having hallucinations." To the sour-looking doctor who got around to him at ten o'clock, he said, "I'm having hallucinations."

The doctor looked a little more sour. "What sort of hallucinations?" he

wanted to know, "Girls, or pink elephants?"

"Neither." And Jeremy told him what had happened, and showed him the letter from his mother.

The doctor was looking increasingly sour. "What else?" he demanded. "That's all."

"You said hallucinations."

"Just the one," said Jeremy. "Just that one."

The doctor glowered at the letter from Jeremy's mother, and then glowered at Jeremy. "You wouldn't be malingering, would you?" he demanded.

"No, sir," said Jeremy. He was getting scared again-basic training was a good place to learn how to be scared-and he was devoting a lot of time to trying to cover it. If the doctor thought he were scared, he would think it was because Jeremy was guilty of something. Like malingering, which meant goofing off by faking sickness, and which could result in a courtmartial.

"You wouldn't be," continued the doctor, glowering more than ever, "angling for a section eight, would you? You figure you'd rather be a nut than an airman, is that it?"

"No, sir," said Jeremy.

The doctor dropped the letter on his desk where Jeremy could reach it.



and leaned back. "I don't know what you want from me," he said. "You aren't physically sick. You say you had this one hallucination five days ago, and now here you are on sick call. What do you want me to do about it?"

"I keep worrying," Jeremy told him. "I keep thinking as though it really happened. I can't think about anything else."

The doctor sighed, looked sour, shook his head. "There's nothing I can do," he said. "Forget it. If it was an hallucination, so what? It's all over, and it didn't come back. So forget about it."

"That's why I'm here, sir," said Jeremy. "I can't forget about it." "You want to see a psychiatrist, is that it?" The doctor's tone showed

clearly that this proved his earlier suspicions, that Jeremy was a faker trying to get a section eight, hoping to get an insanity discharge. Jeremy almost said no. He didn't want anybody to think he was a malinger

or a fake. He didn't want anybody to think that he would try to lie his way out of the Air Force.

But the memory of the last five days was too strong in him. He'd been sleeping poorly, he hadn't been able to concentrate on anything, his marching had deteriorated to worse than what it had been his very first day in basic training, he was goofing up on inspection, he was generally confused and miserable over this thing. So he nodded and said, "Yes, sir, I guess so."

The doctor sighed. "All right, airman," he said heavily. He made a brief note in Jeremy's medical record, and wrote something else on a small sheet of paper which he clipped to the record folder. "You come on sick call on Thursday morning." he said, "Go on back to your flight now."

"Yes, sir," said Jeremy. He got to his feet. "Thank you, sir."

The doctor mumbled, and looked sour,

The chief surgeon was being difficult. He, too, was a bird colonel-just recently having received his eagles, from the obvious pleasure he took in making life difficult for another officer of equal rank-and he saw no reason why he should do what Colonel Brice wanted. "Medical records," he said pompously, "are classified material. Authorized personnel only. I'm afraid I'll have to know your reason for wanting to see this man's records, and also your request will most definitely have to come through the proper channels. You must know, Colonel Brice, the proper procedure for-

"Ketchup," said the colonel, disgusted. Since his two boys had grown old enough to understand and imitate the vocabulary of their elders, this had become the colonel's one swear word, and it was usually disconcerting to other people the first time they heard him use it.

It was disconcerting to the chief surgeon. "I beg your pardon?"

"Where's your hot line?" demanded the colonel.

"Well, really, Colonel, it requires an emergency of-" "Ketchup," said the colonel again. He came around the chief surgeon's desk and, over that astonished gentleman's protests, proceeded to open desk drawers.

The bright red phone was in the bottom drawer on the right-hand side. The colonel picked it up, waited a second, and then said, "Brice. For Corey." He waited a few seconds more, and then said, "Jack? I'm fine. I want some records and-Right you are." Deadpan, he handed the receiver to the chief surgeon.

The chief surgeon, bug-eyed, put the phone to his ear and announced his name and rank. Then he listened, nodded vacantly, said, "Of course, sir. Certainly, sir," and put the receiver gently back onto its cradle. He closed the door, and in a chastened voice said, "I had no idea—"

"That's all right, Colonel. Now, if I could have the medical records-"

"Of course. Certainly. Immediately."

It took, as a matter of fact, just about ten minutes for the records to get into Colonel Brice's hands. Then the colonel, at his request, was given an empty office where he and Clark and Swanson could look them over at leisure.

They already knew quite a bit about their man: Jeremy Masters, Airman Basic, AF12451995; twenty years, five months and twelve days old; born in Crane City, Pennsylvania; lived there all his life until he went away to attend a small liberal arts college at Marshall, in the same state; two years of college, average grades; enlistment in the Air Force; score of 73 on the Armed Forces Qualification Test. Stanine scores ranging between six and eight, with a nine on clerical; negative police check; a class one physical profile on everything except eyes, where he had a two, being somewhat nearsighted; no known subversive activities, and made no sports teams in high school or college; studied trumpet four years, not very good at it.

And now they learned one thing more. What the disappearance act meant.

"He went home," said Clark softly, wonderingly. "He up and went home."
The colonel nodded. "I've been waiting for a telepath," he said. "And
I guess I'm still waiting for one. But it looks as though I've finally got hold
of a real live teleport."

"He refuses to believe it," said Swanson. He tapped the doctor's scrawled notation on Jeremy Master's medical record. "He's talked himself into thinking it was an hallucination, you notice?"

"Just wait till we tell him different," said Clark.

"No," said the colonel.

The other two looked at him, questioning. "You aren't going to tell him?" asked Clark.

The colonel shook his head. "Why not?"

"However he managed to do it," explained the colonel, "he's managed now to get ind of the knowledge. It won't do any good to just go to him and tell him he really did teleport after all. He won't believe it, to begin with. He'll think it's some sort of crazy psychological test. And even if he does believe it, so what? He obviously doesn't have any control over the ability. He's no good to us as a man who teleported once and can't remember how."

"So what do we do?" Clark asked.

The colonel closed the medical records folder. "We let nature take its course for a while," he said. "With a nudge or two in the right direction from us."

Jeremy had seen the doctor on Monday. He had three more days of distracted incompetence to live through, with the TI calling him a yardbird and a goof-up and a few less printable things, and then it was finally Thursday, and he went back on sick call again.

This time, the white-parked medic took his name and went away and came

hack and said, "You sit over there." "Over there" was a small alcove containing three leather sofas. Four miserable looking basic trainees were already there. Jeremy joined them, and waited. There was no conversation at all among the five; they were all too

full of their own frightened thoughts. At eleven-thirty, another white-earbed medic came along, "Follow me,"

he said, and walked off.

Jeremy and the other four followed him out a side door. There was a truck parked there and, at the medic's brief order, they climbed up into the back, Planks were stretched benchlike across the interior. They sat down, braced themselves, and fifteen minutes later the truck jerked forward and drove out of the base.

They rode for two hours, and then they arrived at Robinson Air Force Base, on which there was a hospital. The truck bounced to a stop in front of the hospital, and the medic came around and said, "O.K., come on out,"

Jeremy and the other four clambered down from the truck

The medic said, "Any of you guys hungry, go on to the chow hall with the driver here. If you ain't hungry, come on with me. And if you go to the chow hall, you get right back here after you eat. I'll be waiting inside by the desk." Jeremy wasn't hungry. It was past lunchtime, but he wasn't hungry. He

was too nervous to be hungry.

Apparently, all the others felt the same way. The five of them trooped into the hospital behind the medic. Another medic took over at that point and led them down an endless series of halls to an alcove almost exactly like the one they'd left two hours ago back at the infirmary, and left them sitting there,

Half an hour later, an Airman First Class with a clipboard came over and called out a name. One of the five stood up and said, "That's me sir."

"Don't call me 'sir,' " said the Airman First Class absently. "Follow me."

Jeremy was the second one called, twenty minutes later. He remembered not to call the Airman First Class "sir," and he felt very small as he followed the man-with-clipboard down the green corridors past all the white rooms.

The psychiatrist looked like the doctor, except he had less hair. He sat on one side of the desk, and Jeremy sat on the other, and he listened impassively as Jeremy described his hallucination. When Jeremy was finished, the psychiatrist said, "This wasn't real?"

"No, sir," said Jeremy, "I mean, how could it be? It must have been an

ballucination."

"Then what's the problem?" the psychiatrist asked him. "If you believed it, if you really thought you'd gone home for a minute, then we'd have a problem on our hands. But if you already realize it was an hallucination, then I don't see the difficulty."

"I know it was an hallucination," said Jeremy. "But I can't forget it. It's as though I really believed it. I just can't get it out of my mind. It scares me."

The psychiatrist studied his fingernails. "I'll tell you frankly," he said, not looking up, "I have the feeling you're blowing this thing all out of proportion. I'm not saying you're doing it consciously, I don't know whether you are or not. But here's what I think. I think you're sorry you enlisted, and you wish you were home. I think you wish there were some way you could get out of the Air Force. So, to give you the benefit of the doubt, I think you've talked yourself into believing you had this hallucination, with some vague idea of

getting a section eight."

"No, sir," started Jeremy, but the psychiatrist raised a hand for silence.
"I'll tell you the rest of what I think," he said. "I think there's the possibility you're making this whole thing up, that you're consciously trying to wangle a section eight. That's a possibility. But I also think it's more likely that you yourself don't exactly realize what you're doing. But consider the hallucination itself. Home. You wanted to go home. You still want to go home."

"No, sir," said Jeremy. He was still frightened, but he was beginning to get a little angry, too. Seven weeks of basic training had dulled his self-respect, but hadn't totally deactivated it. This bland witch doctor was calling him a

liar and a sneak. "It isn't like that at all, sir," he said.

"It isn't? Well, then, you tell me what it is like."

"This thing—happened," said Jeremy. "I don't know what it was. It felt real, it felt as though I were really home. It only lasted a second, and then was right back again. But it felt real, and then I got that letter from mymother, and I just can't get rid of the idea that maybe it really did happen. I know

it's impossible—but it happened."

The psychiatrist said, "I'Im-m-m." He studied his fingernalis again. At length, he said, "You don't really went a section eight, boy. Or do you have the idea an asylum is better than the Air Force? It isn't. You're in your seventh week of basic training, You have four weeks to go. I realize basic training is rough, but it has to be, and things will calm down once you complete it. If you aren't careful, right now you can put a black mark on your record that will stay there for the rest of your life."

"Sir," said Jeremy desperately, "I can't sleep, I can't eat, I can't concentrate

on anything. I don't know what to do. I want somebody to help me."

"If I saw the problem—" started the psychiatrist. He shrugged and pursed his lips and studied his fingernails. At length, he said, "Do you know what sodium amytal is?"

"Yes, sir. A truth serum."

"Not exactly, but that's close enough. I'm thinking of giving you an injection of sodium amytal. There's either more or less to this than you'r tetiling me. Now, if you want, you can stand up and walk out of bere now and go on back to your outfit, and no questions asked. If you stay here, and under sodium amytal you tell me you're faking, you'll face court-martial action. Do you understand that?"

Jeremy nodded. "Yes, sir."

"Well? What's your decision?"

Jeremy's hands clenched in his lap. He wasn't faking, he knew he wasn't faking. He had seen the hallucination.

But what good would it do to convince this man he was telling the truth?

The psychiatrist was right, an insane asylum was a lot worse than the Air Force.

No. It was the truth. This thing had happened, and if Jeremy didn't get some help soon, it would drive him crazy.

Then he wondered, What kind of help do I want?

I want someone to explain it away.

That was it, that was the core of it. No matter how much he knew that it

had been an hallucination, no matter how often he convinced himself of that, he still didn't believe it. Way down inside, he believed it had really happened, he had really gone home.

And that was what he wanted, somebody to shake that belief, somebody to prove to him that he was wrong, somebody to explain that hallucination away. Until that was done, he would just go on worrying about it and being

frightened of it.
"I'll stay, sir," he said.

The psychiatrist said, "Um-m-m," again. He nodded, and got to his feet. "Come with me."

There was a high leather-covered cot in the next room, beside some complicated-looking apparatus. At the psychiatrist's orders, Jeremy rolled up his left sleeve and stretched out on the cot. The intravenous injection began, and the psychiatrist alternated between studying his watch and peering at Jeremy's face.

It was a strange sensation. First the prick of the needle, and then a spreading



warmth and a drowsiness, and the end to worry. It was so pleasant, so pleasant to know that there was nothing to be afraid of, nothing to worry about, that nothing in all the world was really very important. He could even stop hiding

the truth Time passed sluggishly, and when the psychiatrist spoke at last his voice was far away and muffled. "What is your name?"

It took no effort to talk. He was easy and relaxed, and he didn't care, "Jeremy Masters," he said.

"And how old are you?"

"Twenty."

"How tall?"

"Six foot."

"Did you have an hallucination a week ago vesterday?" Why not tell him the truth? It didn't matter. "No."

There was a pause, and then the psychiatrist said, "What's your mother's first name?"

Jeremy smiled, "Alma,"

"What's your father's first name?"

"Richard"

"Why did you lie about the hallucination?"

"I was afraid to tell the truth."

"I see. And what is the truth?"

Why not? "I went home."

The pause this time was longer, and when the psychiatrist spoke again his voice was somewhat sharper, "You really went home?"

"Yes."

"Why?"

"I was afraid." "How did you do it?"

Jeremy frowned, trying to concentrate. But it was too much trouble, the answer was too far down, "I don't know," he said, "I don't remember,"

"Could you do it again?"

No hesitation this time, "Yes,"

"Let's see you." Jeremy thought it over, and slowly shook his head. "I can't. Not now."

"Why not?"

"You're looking at me."

"I'll turn my back." "No. It isn't dark."

"It has to be dark?"

"Yes. And nobody seeing me. And . . . and right now I have to be scared."

"What do you mean, right now?"

"Maybe . . . maybe I'll get better. I don't know." "I see. And have you ever done this before?"

"Then how did you know you could do it?"

"I didn't. It scared me."

"But you really did go home?"

"Yes. I really did go home."

The psychiatrist sighed, and moved around the room a bit, and then he came back and asked Jeremy some questions about girls, and whether or not he liked the Air Force (he didn't), and whether or not there was any epilepsy in his family (there wasn't). Then the psychiatrist said, "All right. You take a nap now, and I'll talk to you later." He did something with the needle that was still in Jeremy's arm, and Jeremy went to sleen.

The psychiatrist's name was Holland, and his rank was Captain. And he was very curious. "Quite frankly," he said, "I wonder what your interest

in this man is."

"Quite frankly," said the colonel, "it's none of your business. I don't mean to be overly tough with you, but I'm afraid that's the way it has to be. I'll be the one asking all the questions, and you'll be the one giving all the answers."

Captain Holland's face froze. He had plainly decided that he didn't like this overbearing colonel very much at all. Well, that was too bad. It would be nice to be liked, but it wouldn't get much accomplished. And the colonel meant to get things accomplished.

"You gave him sodium amytal, is that right?"

Captain Holland nodded, stiffly,

"What did he say beforehand?" "That he had had an hallucination."

"And under the narcoanalysis?"

"He admitted that he believed the delusion. That he believed he had gone

home. Wish-fulfillment, nothing more." "It's a little early for an analysis," said the colonel. He got to his feet

and paced the floor, ignoring the cold gaze of the captain. At length, he said, "What do you plan to do with him?"

"Send him back to his outfit," said the captain. "This is only a temporary thing. Given other things to think about, it'll wear off,"

"No," said the colonel.

"What's that?"

"You'll send him to the hospital at Dover," said the colonel. "For observation and treatment." "But . . . but that's absurd. He doesn't need observation and treatment,

all he needs is a few days to forget all this."

"It could be," said the colonel, "that I don't want him to forget it."
"Sir," said the captain stiffly, "my first duty is to my patient. I must strongly protest any attempt to make this delusion seem overly important to him. We could blow it up now to the point where there would be-"

"Your first duty," cut in the colonel, "is to the Air Force, and through

the Air Force to your country."

"I don't see how badgering a poor airman basic is going to be of any advantage at all to either the Air Force or the nation." "You don't have to see that, Captain. All you have to do is take my word

for it." "I assure you, sir, that I fully intend to protest this action of yours-"

"Ketchup!" snorted the colonel. "Protest all you want."

"In all my years in the service--"

"You still haven't learned to obey orders. Now, listen to me. This is

for observation. You are not to mention me at all, and you are not to tell him your own personal feelings on the subject." "Until I have a direct order from the surgeon general," said the captain

hotly, "I have no intention of so mishandling a simple case like-"

"You have a direct order, Captain. From me."

The office door opened, and Ed Clark stuck his head in. "The plane's ready, Colonel," he said.

"Fine," The colonel started for the door, and paused to look back at the captain. "This is important, Captain," he said, "vitally important. You can be sure I'm not making myself difficult for the fun of it."

"Yes, sir," said the captain grimly... "Thank you," said the colonel, "for your co-operation."

Jeremy woke up starving. The light seeping through the closed Venetian blinds over the room's one window was tinged with red, so it must be late afternoon.

He sat up and swung his legs over the side of the cot. He felt refreshed, but dizzy.

And then he remembered the questions, and his own answers, and his

hands clutched the leather covering of the cot as he stared across the room. He believed it. He couldn't kid himself any more, he couldn't try to convince himself any more that it was just an hallucination. He believed it, he knew it, and so did the psychiatrist."

He shouldn't have come here. He should have hidden it, held it down, learned to live with it. Because now the psychiatrist knew, and the psychiatrist could come to only one conclusion. That Jeremy Masters was crazy.

Maybe I am, he thought. Maybe I really am.

The door opened, and the psychiatrist looked in. "Ah," he said, with false joviality, "you're awake. And I imagine you're hungry. You woke up just in time for dinner. Come along."

The psychiatrist was angry about something, Jeremy could feel it, but he was too worried about himself to pay any attention to the feeling. "I told vou, didn't I?" he said.

"Yes, you did."

"Am I crazy?"

The psychiatrist looked away. "No," he said. He started to say something, then obviously changed his mind and said instead, "There's an ambivalence there. You believe that this hallucination was real, and yet you understand that such a belief is a symptom of mental imbalance. You haven't been completely captured by the illusion. I don't think it will take too long to straighten you out."

"Will I be staying in the hospital here?"

The psychiatrist made an angry gesture. "Only till tomorrow," he said. "Then you'll be going to another hospital." "An asylum?"

"No. Another Air Force hospital. For . . . for observation, that's all." "I see," said Jeremy hopelessly.

The false joviality was back. "Don't worry about it," the psychiatrist said, "You want to be cured, and that's half the battle."

The next half hour was a confusing one for Jeremy. The psychiatrist turned him over to a man-with-lighboard, who turned him over to a starched smilling nurse, who traded him a set of blue-gray hospital pajamas for his uniform fatigues, and who then turned him over to another patient, a lanky buck-toothed grinner named Bob, who took him away to the hospital chow half for dinner.

And all through that half hour, and all through dinner, and all through the long bright evening in the eight-man ward where he was to sleep that night, he kept remembering what the psychiatrist had said.

"You WANT to be cured, and that's half the battle."

If he had traveled seven hundred miles in one split second—if he had traveled seven hundred miles in one split second—did he want to be cured?

The next day, a different starched nurse gave him back his uniform, and att en hundred hours he followed yet another man-with-clipboard to a bus, which he boarded with nine other people. The bus was ancient, still painted the Army olive drab, and it bounced and jounced across the base to the flight line where, two hours later, the ten of them pere put on a goony bird and told to fasten their safety belts. Then, after another ten minutes, the plane took off.

After seven weeks of basic training, Jeremy was used to this kind of treatment. No one had told him where he was going, or how long it would take to get there, or what would happen next, or much of anything else, but that was the Air Force way. One was moved from place to place, and

one simply followed and hoped for the best.

The plane ride took an hour and a half. Jeremy had time to get used to the novelty of flying in an airplane and looking out the window at the patchwork quilt below, and spent a while looking at the other passengers. Seven of them were clearly patients like himself, dressed in rumpled fatigues and looking worried but fratalistic. The last two were also in fatigues, but the fatigues were neat and pressed, and encircled at the waist by cartridge belts from which dangled holstered automatics.

Guards. Without anyone mentioning the fact, without anyone talking to him at all, he had passed progressively through the stages from basic trainee

to patient to prisoner.

His depression wasn't dispelled after the plane landed. The guards herded the seven onto another bus, and they were driven to a gray stucco building

with bars on the windows of all five floors.

And the next two days were routine. The routine, that is, that Jeremy had come to expect from the Air Force. There was the checking out of pajamas and bedding, there was the assignment to a ward, there was the filling out of innumerable forms, there was the lecture by a Staff Sergeant on the degree of cleanliness to be maintained in Jeremy's "area"—that section of space-time which included his bed and bedside table in the eightman ward—there was the bad chow hall food, and there was the hillbilly three beds away who owned a small radio which was at all times tuned in to Wheeling. West Virginia.

On the third day, there was another psychiatrist, a major named Grildquist. Major Grildquist was a fat bald man in a rumpled uniform. He smiled at

all times, and his eyes were ice-blue and watchful.

The first interview with Major Grildquist was exactly like the interview

with the psychiatrist at the other hospital. There were the questions and the answers, and then the sodium amytal and more questions and answers. And then he was sent back to the ward.

He lay miserable in the bed, listening unwillingly to Wheeling, West

Virginia, and wondering what was going to become of him.

He should have kept it to himself. It was too late now, and now he knew it. He should have kept it to himself.

The four of them were sitting around the living room of Colonel Brice's suite in the BOO, drinking beer and talking things over. Colonel Brice pased the floor, caged and impatient. Ed Clark sat on the arm of the sofa, happing cager. Paul Swanson sat slumped on the sofa, apparently bored and half-asleep. And Major Grildquist sat on the edge of his chair, his round face open and excited.

"Teleportation!" exclaimed the major. "That was the one I was willing

to bet we'd never find, and, by golly, here's one right here!"

"I wanted a telepath," said the colonel grumply, Inaction always made him grouchy, even when he understood the need for inaction, for waitingand-seeing. "I need a telepath," he went on. "Somebody to dig down into the bottom of that fool boy's mind and find out what makes him tick. He doesn't understand the thing himself; he's devoting all his energies to denying it ever happened."

"A natural reaction," said the major complacently. "He'll get over it.

Once he understands that it really did happen to him, and that it's an ability we can use..."

"That's just it," snapped the colonel. He stopped his pacing to glower at Major Grildquist. "Once he understands. But how are we going to get him to understand?"

"We could tell him," suggested Paul Swanson.

"No. He wouldn't believe it, and he wouldn't be any closer to finding out just how he managed to do it in the first place. We've got to force it out of him. We've got to find some way to force him into such a position that he'll have to use that talent of his again. We've got to force him to believe in himself, and then we've got to force him to understand himself."

"It isn't going to be all that easy," suggested the major.

"I don't care whether it's easy or not," the colonel told him. "I just want it done. And it's your job to do it."

The major nodded, unruffled. He'd known Jim Brice for twelve years. He understood that the colonel's abruptness wasn't so much the result of a nasty personality as it was the result of his single-minded desire to get the job done. The major realized that no offense was intended, and so no offense

"I'll do the job," he told the colonel. "Or at least I'll take a healthy stab at it."

"A healthy stab isn't enough. I want that boy's ability out on the surface' where I can get some use out of it."

"You talk as though you owned him," the major chided gently.

"I do," said the colonel. "I own his ability, at any rate. Or I will, once you dig it out for me."

"Own it?"

"I'll get the use of it," said the colonel, "I can't teleport myse,f, but I don't have to, not if I have someone else who can do it for me. I'll pet the use of his ability, and what's that if it isn't ownership?"

"If I didn't know you better." the major said, "I'd think you were power-

mad."

"Not power-mad. Power-hungry. That I am. I have a job to do, and a tricky job, and I need all the power I can get, in order to do that job, And

I need the power locked up in that boy's mind." "Us slaves do O.K.," said Ed Clark, grinning.

"I own his ability," said the colonel, pointing at Ed. "I get to use it through him, and he doesn't feel as though I'm some sort of evil mastermind. Do you, Ed?"

"Sure I do." said Clark, the grin even broader than before, "But it's

worth it, to get to wear civvies and eat in the BOO."

"It's a pity," said the colonel, "that brains and psi-talent don't always go together.'

"Simple Simon met a psi-man," said Clark.

Paul Swanson spoke up for the first time. "Simple Simon was a psi-man." he said. He looked at Clark, "Hi, Simon,"

"Knock it off," said the colonel. He looked back at the major, "What do

you intend to do with this boy?"

"Run him through the mill." said Grildquist, "Give him the hurry-upand-wait routine, and wait for him to realize he's on the treadmill. He isn't going to cough up that ability you want until he realizes it's the only way

he's going to get off the treadmill." "How long?" demanded the colonel. The major shrugged. "A finite time," he said. "If I try to rush him too fast, he's liable to react in the opposite direction, shove the whole thing so

far down into the subconscious we'll never get it out."

"I want that boy," said the colonel grimly. "Patience, Jim." said the major, "Patience, I'll give him to you on a silver

platter."

After that first interview with the new psychiatrist, Major Grildquist, Jeremy was completely ignored for three days. He spent most of his time in the floor dayroom, playing Ping-pong or pinochle with other patients, reading old magazines, and writing reassuring letters to his parents. He didn't want them to know yet what had happened to him, so he told them he'd caught a flu bug of some kind, it was nothing serious, but he'd probably be in the hospital for a few days.

And he waited for the psychiatrists to cure him. He wanted to be cured,

and the other psychiatrist had said that that was half the battle. But nothing happened. He waited, and waited, and waited, and nothing

happened. Until the afternoon of the fourth day. Then he was transferred from the

eight-man ward to a single room. By this time, he knew the hospital scuttlebutt. A man in a ward was relatively healthy, and could expect either to be discharged from the service

on a medical, or be returned to duty in a short time. But a man in a single room wasn't healthy at all. A man in a single room could expect either to stay there for a long while or get a section eight discharge and be transferred to a Veterans Administration hospital.

The room he was transferred to was small, squarish, pale gray and Spartan. An army cot, with blue Air Force blankets, a metal bureau, and a metal armless chair with upholstered seat, was all the furniture in the room. There was an ashtray atop the bureau, and he was allowed to smoke.



He did so. He paced the floor and smoked, and worried, and tried to get

this whole thing straightened out in his mind.

He was in a hospital, and he was clearly one step from an insane asylum.

And yet he was the same person he'd boen all his life, with the same attitudes and memories and beliefs. He hand't suddenly started sesting little green men or believing that he was being persecuted, he hadn't gone raging around with a faulte, or gone around setting buildings on fire. He hadn't retreated into an unreachable corner of his brain, and he hadn't developed a second personality, and he hadn't started believing he was the lost heir to the Tasmanian throne, having been stolen as an infant by gypsies.

He was one short step from an insane asylum, and he had given none

of the indications of insanity that he had ever heard of or could possibly

recognize. So, why was he one step from an insane asylum?

Because he had traveled seven hundred miles in much less than a second. He had done it twice, once going and once coming. He hadn't intended to do it, he didn't know how he had managed to do it, and he fervently wished he'd never done it. But it had happened, and he remembered it and believed his memory, and that's why he was moving slowly but steadily toward an insane asylum.

Teleportation. That was the word. There was, at least, a word for it, even though nobody believed in it, just as there was a word for luck even though nobody really believed in the powers of luck good or bad, and just as there had been a word for spaceship long before people believed that things like sputniks and moon shots were really nossible.

Now, here was the crux of the matter. Was teleportation a thing like luck, something that nobody believed in with just cause. In other words, had he

teleported himself home and back, or was he nuts?

He paced the floor and smoked, paced the floor and smoked, and tried to work it all out to a sensible conclusion. He already knew all the arguments in favor of his having teleported—the absolute reality of the second spent at home, the letter from his mother, his own conviction—and now he listed

against them the arguments in favor of delusion and madness.

First, and most obvious, where had this mysterious talent suddenly come from? If he'd teleported, why didn't he know how he'd done it, and why couldn't he do it again? For that matter, why hadn't he done it before? If it required fear, he'd been afraid before in his life. The time out hiking as a Boy Scout, for instance, when he'd almost fallen over a cliff. The night he was in the car with Steve Chalmers and a couple of other guys, and Steve was high as a kite, and drove so madly down that mountain road toward town. Lots of times. If he could do it at all, why hadn't he done it long ago, and why couldn't he do it again now?"

Second, if he had really gone home, why hadn't he stayed there? Admitted, at that particular moment, in that drainage pipe, he had wished more than anything in the world to be safe at home, but if he had really succeeded in

fulfilling that desire, why had he come right back?

Third, if he was going to go around thinking he was unique, some sort of superman with strange powers possessed by no one but himself, then he was a candidate for the twitch factory, and no questions asked. If he had the power to teleport, that must almost inevitably mean that other people had the power to teleport. Why hadn't they? After thousands of years of recorded history, why hadn't somebody somewhere along the line proved that teleportation was not a thing like luck?

Those were the three arguments, and when he lined them up against his own shaky conviction, the reality of a memory lasting just about one second, and an ambiguous sentence in a letter from his mother, the arguments against seemed pretty strong and the arguments for seemed pretty weak.

He lit a new cigarette from the butt of the old, and paced the floor some more. Never mind trying to bolster the arguments for, that wouldn't get anywhere. He had to forget for a few minutes that he was worried and afraid and that he hadn't the vaguest idea what the future held in store for him, and he had to concentrate on this problem just as calmly and logically as he could. The time had come to look for holes in the arguments against.

Number one, why hadn't he done it before? The only possibility was that it had required a certain narrow set of conditions before the ability could

express itself. What, then, were the conditions?

Well, it had been dark, pitch-black, it hadn't been possible for him to see the rims of his glasses while he was wearing them. And he had been in a confined space. And he had been in a stress situation, feeling frantic, feeling that all was hopeless, and desiring more strongly than ever before in his life to be somewhere else. Some specific where else.

The first psychiatrist had asked him if he could teleport again. In his narcosynthesized condition he had answered no, and had given two reasons: He wasn't alone, and there was no pressing need to go anywhere else.

All right, then. It required at least some but probably all of the conditions he'd just outlined. And could he honestly say that he had ever before in his life been in a situation with all of those conditions simultaneously present?

No. he couldn't.

Then that was why he'd never done it before.

And had there been, since then, any other time when all of those conditions had been simultaneously present?

No, there had not been.

Then that was why he hadn't done it again.

On to number two. If he had really gone home, why had he come right back? He tried to remember back to that second at home, tried to remember what his feelings and thoughts had been in the flash before returning to the point of departure.

He had been frightened. He had been really frightened that time, and he'd had every right to be. Sure, if he'd planned to teleport himself home, and he had then done it, he might simply have strolled on downstairs and

said, "Hi, folks, I'm home."

But he hadn't planned it. And having the world suddenly shift seven hundred miles beneath you, without expecting it, is pretty shocking. The mind rejects the whole idea. The mind says, "Go back! This isn't happening!" The mind says, "Go back! This isn't possible! This is madness and chaos and death!" And you jump right back again.

And that was why he hadn't stayed home. He'd been too shocked and terrified at being there. He had probably snapped back just in time to avoid

either a heart attack or the loss of his mind.

And that left argument number three. If he could do it, why couldn't other people do it?

Well, let's narrow it down. Maybe some people can do it, just as some people can carry a tune and some people have 20-20 vision and some people

can multiply four digit figures by three digit figures in their heads.

He could narrow it down, but that didn't help much. He could say that it was also, aside from being an occasional characteristic rather than an inevitable characteristic, one which developed with maturity. That was another possible reason for his never having done it before, but no matter how much he narrowed and hedged, it wasn't going to do much good unless he narrowed it all the way down to one, unless he drew a line with himself on one side and the whole human race on the other.

And then he remembered his Aunt Sara and his Uncle Fred, on his mother's side. Bight years ago, Uncele Fred was killed in an airplane accident out in California, on the western slope of one of the Rockies. The day after that, when the news came, Aunt Sara, a kindly church-going old lady in her early sixties, insisted that she had had a premonition. Last night, she told anyone who would listen, at almost precisely the same time that poor Uncle Fred was dying against that mountainside, she swore she saw him standing in the kitchen, right next to the refrigerator. She had been in the living room, watching the television, in that mohair chair by the radiator, where she could look straight down the hall to the kitchen, and she swore she saw him standing there. And—the way she later told it—she'd said, "Why. Fred, what are you doine home so early?" And he was sone.

Of course, nobody had believed Aunt Sara. She kept on telling the story right up to the day of her death, a little over a year ago, and everybody ust classed it as Aunt Sara's one lanse into mysticism, brought on by the

death of Uncle Fred, and let it go at that.

Jeremy had told the story himself once, just once, and not with any belief in it. It was two years ago, when he'd been a freshman in college. He and a bunch of other guys in the dorm were together having a bull session, and the conversation had gotten around to ghosts and voodoo and scances and mysticism in general. All of them, being college freshmen, had the world completely fligured out, and to a man they put down all that mystical nonsense as a lot of mystical nonsense. They took turns telling stories they'd heard, about phony mediums and voodoo dolls and whatnot, and Jeremy added as his contribution the story of his Aunt Sara and his Uncle Fred. Aunt Sara was still allive then, and his telling of the story was rather sarcastic and not at all kind to the old lady.

Once he'd told the story, another freshman assured him pompously that what he had just described was "a very common phenomenon, especially in wartime." It seemed that the appearance of a loved one at just around the same moment when, it was later learned, that loved one was being killed in an enemy attack or a mine eavei-in or an automobile accident, was one of the old standby situations of the believers in mysticism. It was even more common in mystical lore than the anobearance of a lone-dead relative. And it was, of

course, all nonsense, easily explained by psychology.

Everything was easily explained by psychology, Jeremy realized now. Onct you accepted the basic postulate that the mind could play tricks on a person, suddenly and without apparent reason, you could explain away just aboue anything that ever happened to anybody. You could prove to a man that the Earth was made of green cheese, if you first got him to accept the basic postulates of psychology.

Jeremy had believed the easy explanation of freshman psychology at the time. But now he'd been on the other end of that sort of visitation, and the

easy explanations of psychology had a lot less appeal for him.

Because there was another explanation, one that didn't require labeling nice down-to-earth old ladies as sudden crackpots.

Say that the ability to teleport was present to a greater or lesser degree in all men, just as memory is present to a greater or lesser degree in all men. There are some men with photographic memories, who can remember every

word of a seven hundred page chemistry text six months after reading it once.

And there are some men who can never remember a telephone number or
an appointment or a birthday or what they did with the other cuff link.

Say the ability to teleport was present in men in just as wide a range as the ability to remember. And say that that ability is so buried in the mind that it is almost unreachable. And the people who have the ability to the greatest degree—comparable to the people with total recall—even those people can't tap the ability until they get into a one hundred per cent frantic stress situation.

All right. Call these people with the greatest degree of teleporting ability latents. Say Under Ferd was a latent teleport. He's sitting in the airplane, probably in a seat toward the rear of the plane, and suddenly the plane bucks and dips and dives straight for the mountain—he can look out the window and see that the right-hand wing has sheared off—and for the first time in his life he's in a situation desperate enough to reach all the way down to the teleporting ability, and he wishes frantically he were home in his own kitchen, raiding the refrigerator, and all of a sudden he's home. Which for shock value is about equivalent to kissing a girl who suddenly and instantaneously turns into a crocodile. So he teleports right back, while he still has his sanity. And the plane plunes into the mountain.

What killed Uncle Fred? The plane crash? No. The basic ingrained inability of the human mind to immediately reject a postulate which has been proved false is what killed Uncle Fred.

And maybe that's why nobody had ever come along before to tell the world he'd teleported. Because it required the imminent danger of death to bring the latent ability to the surface, and because the human being, at the instinctive level, would rather die than have his world turned topsy-turry.

Which was all well and good, except for one thing. He had teleported, and he hadn't been facing imminent death. He had probably felt almost as much blind panic as Uncle Fred, but almosts don't win ball games.

Unless age had something to do with it. Uncle Fred, at sixty-four, might have lived long enough, lived through enough variety of experience, and come to the age where the inevitability of death was real to him long enough ago, so that his panic at seeing the airpiane wing fall off was just about as deep as Jeremy's at twenty, having lived the normal fairly shelicred life of a middle-class American boy, finding himself suddenly blind and helpless in sharply cramped quarters with tear gas drifting toward him from two directions. And the man on the battlefield, who also appeared to a loved one at the moment of his death, would undoubtedly have already been toughened more than Jeremy by wartime Army basic training, which is a lot rougher than peacetime Air Force basic training any day in the week.

Or maybe-maybe he wasn't the first one to survive after all.

He studied that idea, turning it over and over in his mind. There might have been others like himself. Say the potentiality is strong enough in only a relatively few human beings. Say the potentiality is forced into actuality only in some of the latents. Say that the catalyst is a sudden-death situation in most cases, and only rarely does there come along someone as lucky as Jeremy, who found out he had the ability before it was too late.

That would still leave a number of teleports in the world. And, so far as Jeremy knew, there weren't any other teleports anywhere in the world at all.

So far as he knew.

But there might be some that he didn't no about. If there were, obviously, they wouldn't know about him. It might worth both ways. Other individuals had discovered the ability. Some, totally disbelieving the truth, would push it out of their minds as hallucinations, as Jeremy had tried to do. Some, reluctantly accepting the truth, would keep it a close secret, afraid that they would be considered crazy if they described their experience to anyone, would try to do it again—as Jeremy had tried—and would fail, and would simply go through life occasionally remembering the odd thing that had happened that summer at he lake.

And some would announce themselves, as Jeremy had done, and would be moved slowly and inevitably into lunatic asylums, and there they would stay, because they would be spending their entire lives in a situation of controlled slight stress, with never sufficient panic created to trigger the teleporting ability again.

Was that all of them?

Jeremy hoped not. If those were the three choices—to lie to yourself, to lie to others, or to be classed insane—then the people like Uncle Fred were the lucky ones after all.

There had to be another choice. Why couldn't a man hide the ability from others, but keep working on it himself, training himself to use it consciously? And then find others, there had to be a way that people with this ability could find one another. None of them would be able to tell the normal people, of course. If they tried, they'd be considered members of just another cult. And physical demonstrations, assuming it were even possible to train this ability and bring it under control, could be easily explained away. People who hadn't been present would say the magic words, "Mass hysteria," which make any piece of difficult evidence disappear like smoke, and people who had been present would say. The solone with mirrors. You can't fool me. He's wins!"

At that point, the ceiling light flickered. He had been told about that earlier in the day. It meant lights out in three minutes, and he was to be in bed when

the lights went out. And no smoking.

He crawled into bed, and soon the lights went out, and bars and moonlight formed a diagonal pattern on the wall to his right, shining through his one window. He stared at the pattern, and tried to think.

"I don't like it," said the colonel. "It's taking too long. Nothing's happening."

"Give it time, Jim," said the major gently. "It hasn't even been a week

The four of them were once again in the colonel's suite at the BOQ. While Major Grildquist and the colonel talked, Ed Clark followed the conversation with his usual smiling eager attention, and Paul Swanson slouched moodily on the sofa, watching a pair of small steel balls orbit about one another in mid-air across the room.

"I don't care how long it's been," snapped the colonel. "You haven't done

a thing yet. Paul, stop that."

Swanson looked suddenly guilty, and the steel balls flashed across the room and burrowed into his shirt pocket.

"Well, now, Jim," said the major, "I have done something. In less than a

week, I have put that boy on tenterhooks. Give him a week or two more, and we'll-'

"I don't have a week or two more," said the colonel.

"Push, push, push," said the major gently, "You don't really mean all that, Jim." "The devil I don't." The colonel glanced over at Clark, "What's he doing

now?"

"Still pacing the floor, I suppose," said the major. "Pity we have to treat him this way.

Clark cocked his head to one side and listened attentively. "Nope," he said. "He isn't doing anything. Just breathing."

"Blast," said the major. "Is he asleep?"

Clark listened a minute more, then shook his head. "Not from the sound of his breathing. He's awake, all right. I think he's sub-vocalizing. I wish I could pick that up."

"There," said the major. "You see? Sleepless nights. He was moved to

a single room today, and he knows what that means."

"All right," said the colonel grudgingly. "You know your business, Ben." "Of course I do."

"I just wish there was a way to speed it up."

"What do you suggest? I suppose I could go rushing into his room with a pistol and shoot at him. That might scare him enough to send him popping off home again. On the other hand, it might not. And then he wouldn't be around at all."

"Prima donnas," grumbled the colonel. He glowered at Clark and Swanson. "A bunch of prima donnas."

Clark grinned. A cigarette drifted up out of Swanson's shirt pocket, came to rest between his lips, and a lighter came over from the table. His cigarette going and the lighter returned to the table. Swanson said, "I could jounce his bed a little if you want."

"No," said the colonel. "Ben's right. He knows what he's doing. But at

least let me complain about it."



For two days, Jeremy was left to himself in the single room, allowed out of the room only at mealtimes, and to go to the head. On the third day, his thinking having progressed no farther than on the first day, he was

introduced to group therapy.

Group therapy was ridiculous. A motley collection of fifteen or sixteen sad-looking individuals sat around a good-sized room in leather armchairs, and smoked, and told each other their problems. Then they told each other how to solve their problems. A psychiatrist in civilian clothing sat in a corner and nodded approvingly.

When Jeremy was asked what his personal twitch was, he answered shortly,

"I teleported."

They then all took turns telling him why he had this particular delusion. A couple of his fellow-inmates, there because of sexual aberrations, found a sexual cause of this fantasy, equating it with the dream in which one imagines one is flying. A little guy with a pronounced persecution complex discovered that Jeremy had an unconscious persecution complex and wanted to run away. And so on.

Jeremy went to group therapy for three days, but he could never seem to get into the swing of things. He wasn't having fun, like the other fellows. So he was taken off group therapy, and left to stew alone in his room for two more days. Then he went back to narcoanalysis and Major Grildquist.

The sessions with Major Grildquist were, if nothing else, relaxing. The only time Jeremy could relax and ignore the doubts and the fear about his future was when he was under the influence of sodium amytal. Then it didn't matter any more. Nothing mattered, and he spoke easily and lazily, answering the major's questions and not bothering to worry.

The major had the same technique as the first psychiatrist. He would ask a bunch of questions about high school, and all of a sudden he would say something like, "How did you teleport?" Or, "Can you do it again?"

And his prompt baffled response would always be, "I don't know."

And then they would go back to questions about high school again.

After six days of this, Major Grildquist began to hint about a discharge. The facilities at this hospital were perhaps not adequate for the job ahead, he suggested. The facilities here were adequate only for those with temporary disorders, who could be cured and returned to duty in a relatively short time. It might be the best thing for Jeremy, all in all, to go to a hospital where they had more adequate facilities.

And then the major asked him. "Would you like a section eight, Jeremy?" He was under sodium amytal, and the truth came promptly. "No, sir.

No."

"Why not?" "I don't want to be locked up."

"But couldn't you just teleport yourself out of any cell you were put in?" "I . . . I don't know, I don't know how,"

"How would you like to spend the rest of your life in a VA hospital, Jeremy?"

"Please. Please." Even through the mists of sodium amytal, he could feel the terror created by that suggestion. "No. Please. I want to be cured, I want to be all right. I wish it never happened, I wish, I wish it never happened."

"All right, Jeremy. Calm down. Take a nap, now, and we'll talk about

it again later on. Just take it easy, boy."

But he couldn't take it easy. That night he lay awake in his bed, staring at the ceiling. His whole life was ending here, was ending now. He was going to be just a number, a number and a body stored away in a lunatic asylum somewhere, for the rest of his life.

The next day, he announced himself cured. He told Major Grildquist that he had suddenly seen the truth. And then he proceeded to tell this truth, which turned out to be a long complicated explanation that included just about everything that anyone had said to him over the last two weeks, including one or two points brought up by his team mates on the group therapy game.

Major Grildquist listened to all this in silence, and then he fed Jeremy some more sodium amytal, and the first question he asked was, "Did you

ever teleport?"

Jeremy said, "Yes." And that was that.

The following afternoon, Major Grildquist told him that the papers on his discharge had started their long arduous voyage through half the clerks in the Air Force. Jeremy listened to this, and thought about it all that night, and the next day he had a desperate suggestion to offer.

"Sir," he said to the major hesitantly, "I'd like to try an experiment, if

I could."

"An experiment? What sort of experiment?"

"Well, the thing is, no matter how much I try to convince myself that I really didn't teleport, I just can't succeed. Now, I've thought it out, and I think maybe there are certain conditions that have to be met, a certain kind of situation I have to find myself in, before I can make this teleport thing work."

The major nodded. "You want to simulate the conditions, is that it?"

"Yes, sir."

"And what do you hope to gain from that?"

"Well, if it doesn't work. .". if I can't teleport ... I don't see why that shouldn't convince me that the whole thing was a delusion in the first place. I won't try to fool you or anything, I know that wouldn't work."

"I see," said the major.

"And if it does work," finished Jeremy, "then I'm sane after all."
"I see," said the major again, "You'll try to go home, same as last time?"

"Yes, sir. But this time I'll try to get some place where my mother can see me. Then I'll have proof."

"I'll think about it," said the major, deadpan. "Now, about this seventh-grade teacher of yours-"

"If he wants to try it," said the colonel, "I say fine. That's what we've been working for, after all."

"I'm not sure," said the major. "We might not get the conditions right a hundred things could go wrong—and he won't be able to do it. Then he'll be half-convinced he didn't do it the first time, and we'll have lost instead of gained."

The colonel paced the floor, glowering at the rug. "This is the turning

point," he said. "We get him, or we lose him, right here. What happens if

you turn him down?"

"I'm not sure," admitted the major. "Either he'll revolt, and strain himself to do the trick without my co-operation, or he'll just throw in the towel and give up completely. I wouldn't even try to guess which way he'd go."
"So it's a fifty-fifty chance either way." said the colonel. "Is that it?"

"Just about."

"And what do you advise?"

"I frankly don't know what to advise, Jim. This is the point, as you say. We brought him this far—now I'm lost. From now on, plans and predictions don't mean a thing."

The colonel nodded. He stopped his pacing to glower at Ed Clark, "What

do you think?" he demanded.

"Let him try it," said Clark promptly. "You've been trying to push him into action. He wants to take action now, let him do it."

"Paul?"

Swanson shrugged. "He's liable to know what he's doing," he said, "whether he knows it or not. Let him try."
"Ben?"

The major looked helpless. "I just don't know," he said. "I've grown to like the boy. I hate the thought of pushing him that close to the brink."

"You'd like to just send him home and forget about it?"

"Of course I would. Wouldn't you?"

"No," said the colonel savagely. "I need him too badly. I need him, and you need him, and the whole country needs him. We can't forget him, because we've got to have him."

"Then I suppose," said the major reluctantly, "we'd better let him try

this experiment of his."

Four glasses of beer sailed in from the kitchenette. "I thought we could use some," said Swanson.

Major Grildquist waited two days before telling Jeremy they would try the experiment. And when he did tell him, Jeremy was so grateful he could have cried. "Thank you, sir," he said, his voice breaking, "Thank you. And I won't try to fool you, I swear I won't. And whatever happens, I'll abide by it. If it doesn't work, then I'll know for sure."

"That's, uh, fine," said the major. He bustled at his desk, not looking

Jeremy in the eye. "We'd better make the arrangements," he said.

Two medies were brought in, and they all discussed the physical equipment needed for the experiment. Cramped quarters, for one thing, One of the medies suggested they attach a strait jacket to him and stuff him into a broom closet. Pitch blackness, too, and that could be arranged by using the broom closet in the unused basement of the west wing, where the hall lights could be switched off and absolutely no light whatsoever could work its way into the broom closet, not even a high noon.

That left the third, and probably most important, ingredient, a stress situation, "I will think." Jeremy told them, "about insane asylums."

The arrangements completed, Jeremy was returned to his room. The ex-

periment would be tried the next day.

He didn't get much sleep that night. He tossed and turned, and he went

over and over the details of his plan, and he became fully convinced that it would never work in a million years.

A stress situation? Frantic panic? People don't consciously think them.

A stress situation? Frantic panic? People don't consciously think them-

selves into panic, the environment forces panic on them.

It would never work. It was his only chance, his one and only chance, and

it would never never never work.

By morning, he was a nervous wreck, already feeling the first faint touches

of unreasoning fear. He wanted to call the whole thing off, because it couldn't possibly work and it wouldn't prove a thing, and he would still believe that he had teleported, and they would ship him off to an insane asylum faster than ever. He wanted to tell them to forget it, he'd have to think of something else, but he couldn't. He didn't dare open his mouth. And it was hopeless. He was doomed.

He ate three mouthfuls of breakfast, felt as though he had swallowed three round lead balls, and gave up all thought of food. He paced his room most of the morning, chain-smoking, his fingers shaking when he tried to light his cigarettes, his feet stumbling on nothing at all as he prowled back and forth in the room.

They came for him at eleven, and the sound of the key in the lock was so sudden and at this moment so loud, that he almost screamed and he almost fainted. When they put the strait jacket on him, they had to move his arms for him, he couldn't seem to make them work right. Major Grildquist looked at him oddly, and touched the back of his fingers to Jeremy's cheek, as though he couldn't believe there was any warmth in a cheek that gray. "Are you all right?" the major asked him.

It isn't going to work. He wanted to say that, he wanted to yell it at the top of his lungs, but he couldn't. It was as though he were paralyzed, as though he were a clockwork doll set into motion, and he was walking toward the table edge, and there was no way to stop his motion and keep from falling off that table edge. He trembled all over when he felt the jacket tighten on him from behind, and then he held himself rigid, to keep from trembling again.

"Are you all right?"

He managed to get it out that time. "Yes." The one word was all he could muster.

Then they left the room, and be concentrated on walking. Raise the right leg, bend it slightly at the knee, swing it forward like pushing it through wast-deep water, straighten the knee joint, set the heel down, rock forward, raise the left leg, and repeat. Conscious motion, like learning to walk all over again, and the knowledge that he was going to fail, and he would live the rest of his life in a room like the one he'd just left.

They went down to the basement and stood by the broom closet, "There you are," said the major. "Cramped quarters. And we'll cut the lights once you're in there. We'll give you five minutes."

Jeremy shook his head violently. "No," he said his voice hoarse and sandy. Five minutes alone in that darkness would kill him. Fail and get it over with. He pronounced the words carefully, with someone else's bone-dry tongue and palate. "One minute."

"Are you sure?" asked the major.

He nodded, spastically.

"All right, then."

The two medics helped him into the broom closet, "Good luck," said the

major, his voice oddly inflected, and the door closed.

The broom closet was a tiny upright box so small that his shoulders practically touched both sides, and when the arms crossed in front of him inside the strait jacket touched the back wall, his shoulder blades were just barely brushing the door.

Light crept under the door, and then there was a click, and he was alone and in darkness. Black darkness, and silence, and the wild terror of failure.

He had had a plan. He would go home, as he had before, but this time he would go to the kitchen. His mother would be in the kitchen, getting lunch ready at this time of day, and she would see him. And then he would flash back here and he would tell them, "Call my mother, she just saw me, and that proves it, that proves I can do it and I'm not crazy."

And it couldn't possibly work.

He tried to concentrate on the kitchen-the familiar table and chairs and the curtains on the window over the sink-and he couldn't even visualize it. He couldn't even get a picture of the kitchen in his mind. He tried to think of his mother, he tried to wish himself home and with his mother, and he couldn't do it, he couldn't think, he couldn't concentrate on a thing. The thoughts boiled through his mind, disjointed and screaming, and he couldn't think, he couldn't think, he couldn't think!

He tried to scream out his panic, but his throat was frozen shut and he

could only mouth the words. "Somebody help me!"

He was standing in a living room. There was a green broadloom rug on the floor, a rust-colored sofa and two armchairs, drum tables and a coffee table, A man sat on the sofa, leaning forward over an open file folder on the coffee table. He was dressed in an Air Force uniform, with colonel's eagles on the shoulders. He was gray-haired and lean, with a craggy narrow-lipped face.

The man looked up and blinked in astonishment, "What the hell-?"

This wasn't home!

And he was back in pitch blackness, and this time his throat was open,

and he screamed, and screamed, and screamed.

Light, and the door open, and hands grabbing him as he leaped jerking out, wide-eved and still screaming. The hands held him and he was rushed along, his useless feet bump-bump-bumping against the steps as they hurried him up from the basement.

They put him in a bathtub, leaving the strait jacket on, and they attached a canvas cover over the whole top of the bathtub except where his head stuck

out, and they ran very hot water into the tub.

After a while, they gave him a shot, and he stopped screaming and fell asleep. He came here!" snapped the colonel. He pointed at the middle of the room. "Right there, he stood right there, and stared at me with the most panicstricken eyes I have eyer seen in my life."

"We shouldn't have done it," said the major. His voice was shaky, and he had switched to something stronger than beer. "We pushed him too hard. We shouldn't have done it.'

"Ed!" The colonel whirled round, "What's he doing?"

"Nothing. They gave him a sedative, I guess. He's sound asleep."

"What about tomorrow?" demanded the colonel. He spun back to Major Grildquist, "How's he going to be tomorrow?"

"I don't know. Catatonic, maybe. Or maybe he'll snap out of it."

"If he does, if he snaps out of it-"

"I want to tell him, Jim," said the major. "I mean it, this is too much,

we're driving that boy too far. I mean to tell him the truth."

"And waste the whole thing?" The colonel stood straddle-legged in front of the major, his hands on his hips. "Listen to me, Ben," he said. "Hear me good. You didn't have to look at that boy's face. I did. You don't have the final responsibility for what we're doing to him. I do."

"We don't have the right-"

"We don't have the right to lose him, Ben. We don't have the right to throw him away. We don't have any choice. I wish we had, but we don't."

"It's gone too far, Jim. I'm going to tell him, tomorrow-if he's capable of understanding anything."

"And lose the whole thing? He's gone through a lot, Ben, I'll agree with you. And so have we. If you jump the gun on this thing, you're wasting all that trouble and all that torment. If you jump the gun, he's going to have gone through all this for nothing."

The major rubbed his forehead with the back of one pudgy hand. "You're right," he said at last, "I know you're right, But I look at that boy, and .

never mind, you're right."

"It must be near the end now," said the colonel, more softly. "It shouldn't

take too much longer."

The major shook his head, "What should I do?" he asked, "When I talk to him tomorrow. If I talk to him tomorrow, if he's in any condition to talk to anybody tomorrow."

"Tell him it didn't happen," said the colonel immediately. "Tell him it was another delusion. You know the lingo, do your best to convince him

he's nutty as a fruit cake. And then let him stew on it a while." Ed Clark cleared his throat hesitantly. "Does it have to go on any more, colonel?" he asked. "Couldn't we just go to him now and tell him the truth,

and tell him we'll help him get the ability under control?" "How are we going to help him?" the colonel demanded. "We don't know any more about it than he does. No, he's got to prove himself. And in order

to prove himself, he's got to get that power of his under control."

"I guess so," said Clark.

"There's one thing more," said the colonel, "And it makes me even more sure we've got to push this boy to the limit."

"What's that?" asked Major Grildquist.

"He came here. He told you he was going to try going home again, but he came here. I would love to know how he happened to come here, why he decided to come to me."

"You're just a daddy to us all," said Clark.

"Might be," said Paul Swanson from his corner, "you've found that

telepath you've been yelling for."

It took Jeremy two days to get calmed down to the point where he could walk and talk with reasonable accuracy. Then he had another interview with Major Grildquist. He tried to tell him what had happened, but it got too jumbled and confused, so they went back to the old standby, sodium amytal, and then he told the story clearly and completely, giving a full description of the room and the colonel, down to the sound of the colonel's voice.

After the effects of the narcoanalysis had worn off, Major Grildquist discussed the situation with him, "I'll speak frankly with you, Jeremy, You so obviously want to be cured that I really thought there was a chance we'd eventually get you squared away. I've been delaying the discharge papers, hoping the idea of a section eight would help you snap out of this fixation. I went along with the experiment for the same reason.

"I saw him," said Jeremy dully. He was afraid to let himself get even a little bit excited, because he had trouble keeping himself under control.

Major Grildquist shook his head. "I was wrong," he said. "I want to apologize to you for that, Jeremy. The experiment had just the reverse effect from the one we were both hoping for, and I'll admit to you that I should have expected it. You were placed in a severe stress situation, one where you were being forced to prove yourself insane, and it was just too much for you. Consciously, you want to rid yourself of this delusion. Somewhere down in the subconscious, you want to hold onto it. Crammed into that lightless closet, you cracked wide open. The subconscious took over, gave you another teleportation hallucination—the second one that can't be proved one way or the other, significantly-and the end result is that you are now much more deeply rooted in your fixation than you were before we tried the experiment."

The major lit a cigarette with slightly-trembling fingers. "That was my fault," he said, "and I regret it. I wish I could go back and do it all over again, because this time I would stop and think about the implications of such an experiment, and I would never let you go through with it."

"I saw him," insisted Jeremy. "I can tell you just what he looked like,

what the room looked like. You could find him, if you tried to."

"All the living rooms used by Air Force colonels all over the world? You'd be an old man before we finished checking, Jeremy, and then we'd just have to come tell you we hadn't found your man."

"I saw him," said Jeremy doggedly.

"Jeremy, look at it this way. The first time you teleported, you went home, isn't that right? Stress hit you, and you went home. But the second time, given at least as much stress, you didn't go home. Think about that. Why didn't you go home?"

"I don't know."

"You'd already done that. It was dangerous to try it again. Someone might be in the room where you claimed to have gone. You could give yourself just as convincing an hallucination this time, and have it all blown up by a statement from your mother, saying that she was dusting your room at the precise moment when you claimed to be there. You couldn't take the chance. You had to find some place else to go, some place where we could never check your story, where there would never be an opportunity for you to be proved wrong.

"No, sir," said Jeremy. "I saw him."

"You saw a living room very similar in appearance to the ward dayroom where you've spent a lot of time, and you saw a man in Air Force uniform. Jeremy, think, boy! Doesn't that sound more like dream material gathered from your real-world surroundings than like an actual teleportation?"

"You make sense, sir," said Jeremy. "But I still saw him. And I still heard

his voice."

"All right, then," said the major. "Why that particular officer? You said you didn't know him. Two days ago, under narco, you admitted you'd never seen him before in your life, didn't know his name or where he was, and simply claimed you'd gone to him because he could help you. But you didn't know how he could help you! Don't you see what that means? There's only one way this hallucination could help you, and that is by fortifying your original belief.

"Yes, sir," said Jeremy woodenly.

The major sighed. "All right, Jeremy," he said. "We'll get the discharge papers moving now. You should be out of the Air Force in a week. And then you'll go to a VA hospital, where they'll be able to help you a lot more than I have."

"An asylum?"

"A special hospital, Jeremy. Don't worry, it won't be a 'Snake Pit' kind of place."

"Yes, sir," said Jeremy dully.

"I'll tell you the truth," said Major Grildquist to the colonel, "by the time I was finished talking, I'd half-convinced myself. I hope I didn't lay it on too thick."

"We'll soon find out," said the colonel. "I hope."

"What do we do now?" the major asked him.

"Now? Now, we start waiting. We've pushed him as far as we can. From here on, it's up to him. If he's ever going to get control of that ability of his, it'll be between now and the time he expects his discharge to come through.

Ed, what's he doing?"

"He's pacing the floor."

"Good. That means he's thinking."

Jeremy was thinking. He was thinking harder than he ever had before, and all his thoughts circled and spiraled and whirlpooled around and finally bumped up against the same dead end.

The only proof he had was in his head. And if he were crazy, that wasn't very good proof at all.

That was the dead end. Either he was sane or he was crazy, and he no longer knew which he was.

longer knew which he was.

If only he knew how he'd done it. If only he could just decide to go home and poof go home. If only he didn't have to be scared out of his wits before he could do it every time.

He paced back and forth in the small room until lights out, and then he lay atop the blankets on the bed, fully dressed, and stared at the light-and-shadow pattern on the wall, and tried to figure out how he'd done it.

It was like reaching into a vat full of cosmolene and rocks. Somewhere down in there was a diamond, and all the rest were just pebbles. And he had to reach down in and find the diamond by touch alone.

And he couldn't even be sure the diamond was there.

He dug down in, reached down in, searched for the key. What had his mind done those two times? What had it done?

It wasn't just desire, that wasn't enough. There was a switch of some kind, a lever inside his brain, and he had to push that lever before he could do it.

Home. Think about home, about his own bed at home. That's where he wanted to go. Think about it, and push down deeper and deeper into his brain, and try to figure out what his brain had done those two times.

That? The bed felt different.

His eyes were closed, and he kept them closed. His hands moved out from his sides, exploring the surface of the bed. And his hands didn't touch the roughness of Air Force blankets, they touched the smooth coolness of

bedspread. He held his breath, listening, Laughter, from downstairs, Laughter and

applause and a voice. The television set. A car drove by, he heard it.

His mother said something, down in the living room, her voice muffled by distance.

He was home

Still not really sure, he opened his eyes, and the familiar shapes of his bedroom were around him, and it was real, it was real, and he was home.

And this time he knew how.

It was so easy. All you had to do was find it, and then it was so easy.

It was like multiplying numbers in your head. It was the spot where you stored each digit of the answer until the multiplication was complete. A little cubbyhole down in the left-hand corner of the mind, and he'd never used it for anything but the temporary storage of numbers. But if he thought of a place-the hospital room-and did that-

And the pattern of light-and-shadow stripes was on the wall. He was back

in the hospital.

He grinned.

"Sir," said Ed Clark, getting to his feet. "He just went away."

The other three turned to look at him. The major said. "What do you-" but the colonel shushed him with an impatient wave of his hand.

They waited, the colonel and Major Grildquist and Paul Swanson all watching Clark, and Clark listening, and after an interminable wait of

almost three minutes, Clark grinned and relaxed and said, "He's back." The colonel sighed, smiling. "He cracked it. See how long he was gone? This time, he cracked it. Paul, more beer."

"On its way," said Paul.

"The son of a gun," said the colonel, beaming from ear to ear and rubbing his hands together. "He cracked it."

Jeremy lay on the bed in the hospital room, getting used to the idea. He knew where it was now, he knew just how to make it work. So he wasn't crazy after all.

Tomorrow, by golly, he was going to show that major. "Watch this." he'd say, and flick. And maybe the major could spend some time convincing himself that they were both crazy.

Tomorrow? Why wait for tomorrow?

There was that colonel, too.

He could go right now. The colonel would help him, somehow, whoever he was. Maybe he was one of the other teleports who'd managed to avoid winding up in a looney bin.

Then why hadn't he come here?

Never mind. He could go ask him.

Except that he didn't know where the colonel was.

Then how had he found him the last time?

He poked around some more, with greater confidence now, but there was nothing else, only that little switch down in the number-cubbyhole, that was all

Maybe that was all it needed.

"Colonel Whoever-vou-are," he whispered, "Here I come," And flick.

And he was lying on the floor in the middle of the living room. And there was the colonel looking down at him, grinning as though his face would break. And two other people in civvies, off to the left, And Major Grildquist!

Jeremy scrambled to his feet. "Major-!"

"O.K., Jeremy," said the colonel. "O.K., take it easy."

Jeremy looked from face to face, and they were all smiling, all four of them, smiling as though they were proud of him.

And all at once he saw why. "You knew all along," he said wonderingly. "You knew all along."

"We did, Jeremy," said the colonel. "But none of us knew how to drag

that ability of yours up where you could use it. You had to do that for vourself.'

"You're teleports, too," said Jeremy. "I knew there had to be others, I knew it." The colonel shook his head, "You're the first teleport I've run across,"

he said, "You're a very valuable property, boy,"

Jeremy was bewildered. "But-"Colonel Brice," said the major gently, "is what you might call a talent scout. He looks for odd talents-like yours, for instance. And then he puts

them to work." "Work?"

"We'll have orders cut tomorrow," said the colonel, "transferring you to my outfit. You can say goodbye to the hospital and crazy psychiatrists like Ben there."

"Your outfit, sir?" Jeremy was struggling with his bewilderment. "What outfit is that, sir?"

"What do you think? Intelligence."

Jeremy grinned. "Sure," he said. "Sure."

"You'll like the outfit," the colonel told him. "They're all madmen like you and those two."

Jeremy looked at the two young men in civilian dress. The colonel said. "Give him a slight demonstration, boys."

Paul Swanson said, "Think you could use a beer, Jeremy?" "Yes, sir!"

"Coming up."

Jeremy watched wide-eyed as the full glass of beer sailed in from the

kitchenette at waist height, made a sweeping left turn, and halted directly in front of him. He reached out hesitantly, half-afraid the whole thing was an illusion, and there he was holding a glass of beer in his hand.

"Ed." said the colonel, "what's going on next door?"

Clark characteristically cocked his head to one side. "Male voice saying, 'Why not?', sir," he reported. "What's going on?"

"Just a second." Clark listened, and then grinned, getting a bit red-faced. "Well, sir," he said. "There's a major in that suite." "Yes?"

"And a WAF Lieutenant, sir," "Oh. Demonstration ended."

"Yes, sir."

The colonel turned back to Jeremy. "You see? And I have thirty-seven more of them. You bring the strength up to an even forty."

"I never even heard of such a thing," said Jeremy.

"I'm not surprised. This is just about the first secret weapon any nation has ever had that has a chance of staying secret. The whole thing is locked up inside you head. No plans to steal, nothing, And nobody would believe the truth, anyway."

Jeremy shook his head. "I don't . . . I don't get it. How did you know about me? I mean, in the first place, before I was even sure of it myself. How did you know?"

The colonel smiled. "I screened you," he said. "I ran you and a few hundred thousand other boys through a sieve, and you're one of the forty who didn't just slide on through,"

'A sieve? What kind of sieve? When?"

"The tunnel in your case," the colonel told him. "The drainage pipe, where you made your first jump. That's one of my sieves, Look, I'm in about the best position you can imagine for screening a big chunk of the human race for psi. I could screen for anything I wanted. Did you ever know anybody with his heart on the right side instead of the left?"

Jeremy shook his head.

"Of course not," said the colonel, "There're few of them. But the enlistment or induction physical comes up with one every once in a while. Practically every male American citizen goes through that physical. If you were looking for people with their hearts on the right side, there's your screening center, all set up for you."

"I see," said Jeremy doubtfully.

"It's the same with me," the colonel told him. "I've got my screening center, and it's called basic training. It puts the stresse on, it louses up your equilibrium, it rattles you like nothing you've ever been through before. Then it runs you through my sieve, that drainage pipe, which is as completely bugged as a movie set. I'm like a prospector panning a stream. Most of what washes through my pan is silt, but every once in a while a little piece of gold shows up. Like Paul there, who couldn't find his gas mask with his hands, so the mask just came up to his face of his own accord." "And me," said Jeremy.

The colonel nodded, "And you, And thirty-eight others, so far."

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Clark laughed suddenly and the colonel turned to him. "Ed, stop listening! Leave the major alone."

"Yes, sir," said Clark. He sat down and looked attentive to the things

going on in this room.

The colonel turned back. "You're going to be useful, Jeremy," he said. "We'll have to find out your range limitations, if any, and poke around after that other talent of yours—"

"Other talent, sir?"

"You came to me," the colonel reminded him. "You'd never heard of me, didn't know who or where I was, and yet you came straight to me. What did it? Telepathy? Whatever it is, we'll find it."

"I doubt it's telepathy, as such," said the major. "Some kind of increased sensitivity on the emotional level. I imagine."

"I imagine so," said the colonel sardonically. "What other kind of

sensitivity do you know?"
"My psychological training coming out," said the major, grinning. "Reduce everything to iargon."

"Sir." said Jeremy hesitantly.

The colonel turned back to him. "What is it?"

"Sir, I've . . . well, it's been a long time since . . . well, if I'd gone on through basic training, I'd have had a leave home by now, and . . . well, I was just wondering if I could get home for a few days and—"

"No," said the colonel, shaking his head. "I'm sorry, but no. We have too much to do, and too little time to do it in. We've lost weeks already."

Major Grildquist cleared his throat. "Jim, it might be a good idea—"
"Know, Ben, but we just don't have the time. Besides, Jeremy, I'm afraid
you're classed as a military secret, at least for the time being. Not even your

parents are to know about this ability of yours."
"Yes, sir," said Jeremy.

Paul Swanson chuckled. "Colonel," he said, "what are you going to do if Jeremy goes home anyway? Put him in the guardhouse?"

The colonel opened his mouth, and left it open. Then he shrugged and

grinned and said, "All right, Jeremy. Go on home." Jeremy's face lit up. "Thank you, sir!"

"But, Jeremy. Take the train, boy. You're a military secret now, remember that."

"Yes, sir," said Jeremy happily.

Major Grildquist heaved himself out of his chair. "I'll go arrange for the papers," he said, "and have your clothing sent to your room."
"Thank you, sir," said Jeremy.

"Be back here in five days," said the colonel. "Noon on Wednesday."

"Yes, sir." Jeremy grinned and disappeared.

The colonel sat down heavily in an armchair. "Paul," he snapped, "stop playing with that lamp. And Ed, leave that major alone."

The lamp clunked onto the table, and Ed Clark stopped looking attentive.

"Forty of them," muttered the colonel to himself. He shook his head, sighed, and carefully unwrapped a cigar. "Forty of them."

THE REFERENCE LIBRARY

By P. SCHUYLER MILLER

TROYANA, by Colonel S. P. Meek. Avalon Books, New York. 1961. 224 pp. \$2.95.

This is the sequel to "The Drums of Tapsjos" and is vintage 1932 "lost race" science fiction about a part of South America which was then totally unknown. Now we know there is no lost underground city of Atlanteans, Trojans and early Hebrews on the Rio Xingu, let alone carrellly bred dino-saur guardians to keep out interlopers, a grade of television superior to anything we have or are likely to have, and assorted other marvel.

In an interesting introduction Colonel—then Captain—Meek disclaims any special knowledge of the Xingu region. He has not tampered with his

tale to up-date it. As free-wheeling adventure, it hasn't needed it.

In the earlier book, three American adventurers made their way to Troyana, became involved in a revolution against the ruling casts, and were allowed to leave with a reasonable amount of treasure. They took with them one of a pair of stand-in heroines, a damsel some centuries old, who was kidnapped from under their noses by the leader of the revolutionary forces. The book ended with one hero, Frank Nankivell, going back to rescue her—and with a cryptic message received from him months later.

"Troyana" takes up Nankivell's further adventures in and under the lost city, where he finds further monstrous guardians and the last Court of Atlantis, bottled up to await an eventual resurrection. There are bloody battles, more secrets, amazine weapons—the stories ran in Amazine, after all—and an

eventual triumph of the Good Guys over the Bad.

MOON OF MUTINY, by Lester del Rey. Holt, Rinehart & Winston, New York. 1961. 217 pp. \$2.95.

This is the fifth juvenile Lester del Rey has written for what used to be the Winston—now HR & W—science fiction series. It is the third in a serie about the exploration and. I presume, eventual colonization of the Moon.

In this series, del Rey is doing a clever—though I suppose not original thing; shifting his center of attention. In the first two books the hero was young Jim Stanley, whom we met in "Step to the Stars" as a workman on the first space station, and followed in "Mission to the Moon" as he went on a rescue mission, following a space-happy kid, son of the station commander, who had gone to the Moon in a stolen ship.

Now the kid, Fred Halpern—as cocky and insubordinate as ever—has been busted out of the Goddard Space Academy for disobeying orders. His reason: he knew he was right—which is no reason in military circles. But Fred is the

hero of this third book, and its theme is his very gradual maturing. His training wins him a pilot's job on a lunar exploration team; his obsession with the Moon and his experience there are in his favor, but his seeming grand-standing and his real arrogance pile up the odds against him. Even the fact that he has a special psionic talent for sensing orbits hardly justifies his open mutiny—yet had he not mutinied, a test ship and the future of lunar colonization might have been lost.

It's a well done series, but Fred ought to be caught out in a couple of real mistakes, not just tactical blunders.

DESTINY'S ORBIT, by David Grinnell. Avalon Books, New York. 1961. 224 pp. \$2.95.

Let me begin with a confession of bibliographical failure. I simply don't know—though some of you will undoubtedly set me straight too late for me to pass the word along—whether Martin Pearson, originator of "Ajax Calkins," is a pen name for David Grinnell, who uses that unimbibled character in this book. Grinnell thanks Pearson for permission to use Calkins, who flourished in Future for at time; he may be thanking himself.

Anyway, this is a feckless frolic that is hardly worth the price of six months of Analog. Even in wordage, the book doesn't add up to more than a novelette; this is definitely not one Avalon had to cut.

Ajax Calkins is a bored young multi-billionaire of 2080, looking for something to wake him up. His teaser ad gets a response from the representative of a group of asteroid miners, and a cease-and-desist order from a damsel representing Earth-Mars Space Administration. Ajax, needless to say, goes right ahead and becomes Ajax I, emperor of the Trojan asteroids. Not inside Dipther's orbit, they don't fall under EMSA jurisdiction. Not outside, they presumably don't invade the territories of the hostile Saturnians. Of course, all these parties are involved before things are straightened out, But who cares?

ISLAND IN THE SKY, by Manly Wade Wellman. Avalon Books, New York. 1961. 223 pp. \$2.95.

Twenty-two years ago, when this story appeared in Thrilling Wonder Stories for October, 1941, it was typical of the science fiction of the formative years and ahead of most of the "mainstream" literature produced by serious writers. For, crudely and clumsily enough, it was warning against the dangers of totalitarianism, which had the world at war and in a month or two would ensult the United States.

The "island in the sky" of the title is a flying island—what would now be called a "statloid"—kept in a kind of controlled orbit by exertion of mysterious forces, produced by the strange "unknown" elements that exist deep under New York. It is the headquarters and stronghold of the Airmen, who rule the world ruthlessly with blood and circuses—professional soldiers who have banded together after a ruthless world war, to assure that they will reap what the politicians have sown. Corruption . . . the criminal-turned-hero whose strength of character carried up, up through the gladiatorial ranks to successful revolt . . the Good Concubine . . the Underground . . trial by combat and by treachery . . . they are all here. Manly Wade Wellman, even then, wrote better than most of the practitioners of the formula, but who would listen to such stuff?

BRASS TACKS

December 26, 1961

Sir.

I wish to express my delight and appreciation of your editorial in the May edition of ANALOG.

"It ain't my job . . ." openly expresses ideas and conditions which exist in most of America's largest cities. You remind me of Dr. Samuel Abelman in "The Last Angry Man," who struck out against a world of 'galoots' and 'crap artists.'

I have personally experienced the nuisance of your Thruway problem. I hope the Thruway Authority will take time to read your excellent article.-

Sfc John G. Vos, Dhahran Airfield, Saudi Arabia.

I heard from both the Thruway authority and the New York State Police as result of my letter of complaint to the Thruway Authority.

I was wrong in one respect; the Thruway Authority was aware of the

problem-but were stuck with a rougher problem as a result.

Basically, the problem is that there is no place to park your car after you've passed the gas pumps at the New York Thruway foodfuel stations. The fault lies with the original design of the stations—and that's the fault of the engineers who laid out the blueprints. The operating Authority is now stuck with it-and getting more land to extend the station areas is NOT an easy, quick solution, It's involved in n miles of legalistic red-tape. Remember that the Authority is a State agency, and has to get permission, authorizations, etc., etc., from Legislative channels,

Now the quick-and-easy answer would be to make the driveway behind the restaurant two-way, so that a car could be driven back to the parking

lot above the gas-numps.

But here entereth the problem known as some-people-are-unbelievablystupid. And on a 60-mile-an-hour Thruway, carrying heavy traffic day and

night, "stupid" can, almost instantaneously, translate to "dead."

IF the Authority allows people to get started driving in the against-traffic direction in the station driveways-deadly experience shows that some of them will proceed to drive happily out of the station, going 60 miles an hour due north in the 60-miles-an-hour-due-south lanes.

Anybody got a good, safe answer to a problem like that?

Now what Officer George didn't know-nor the station managers at several Thruway stations I checked at-was that some years ago, recognizing the problem, the Thruway Authority took down the ONE-WAY signs on those back drives! They didn't quite dare to encourage people to go the wrong-way of-traffic . . . but they DID make it not-illegal! This, I found, the State Police were NOT aware of!

The Thruway Authority is not at fault.

The fault—the trouble—lies with the breakdown of communication that results any time a system seeks to make men act like robots.

Dear Mr. Campbell:

Good God, Man! Find some more contributors to "Science Fact" like Hal Clement in the March issue. His "Gravity Insufficient" is a masterpiece of innoculation in Scientific Speculation! My God, what I wouldn't give to go to high school again with a science instructor like Hal Clement!

Talk about a chain reaction! Before I got halfway through his fascinating, interestingly developed, and amusingly told "story" (and believe me, I consider that last a real compliment—so few of us can tell "stories" anymore, it's a drying art; i.e., I believe one can belay frustration and think better and more clearly for longer periods when one's sense of humor is "titillated" in the proper direction, if you follow my connotation!).

I had dragged down half the astronomy and physics books on the shelf, including Glasstone's Source book on Atomic Energy, which I haven't touch for God knows how long, and even Einstein's essay on Gravitation. And after finishing Clement's jourcey into the Sun, 1 solemnly owned to pick up the ole correspondence course in Analog with renewed determination and tenacity.

In fact, an "old dream" has even been started again! To and from work I pass L. A. State campus and many times I have promised myself to go back to night school and pick up physics and advanced math. By God, this time I believe I might really do it!"

If such phenomenon ever actually comes to pass, Mr. Hal Clement can

just chalk up a miracle on his wall!

Another thing! By God I'm going to eat beans and buy me a readymade store-boughten telescope and dump my pile of homemade junk!

Let's have Hal Clement again soon on: "The Velocity Constant," for instance, or "Time-Space Barrier" or "Macrocosmic Infinity" or "What's Outside the Universe," or "Uv=c²." And what happened to your promise to die up more information on this Dean Drive business???

Thank you, John Campbell, for doing a wonderful job of editing and publishing.—Phillip Harp, 14108 E. Masline, Baldwin Park, California.

Hal Clement please note! More articles as suggested would be welcome.

Dear John:

One of those odd coincidences just occurred. Only another straw in the wind, but it disposes of your suggestion with the crunching finality of a 16 inch shell in the parietal. I heard this little item in a news broadcast on the same day I read your May editorial. A bill has just been introduced to reduce the literacy requirements for voting.—Joe Newby, Box 222, Jersey City, New Jersey.

"Puh-uh . . . jus' because a guy's in da home for feeble minded 's no reason he can't vote is ut? He's human ain't he? He ain't a criminal is he? So-

duh-w'y shouldden he vete, huh?"

THREE DEGREES OF FREEDOM . . . (Continued from page 5)

The concept of a system of checks and balances always was a good one
—but nobody likes it when it checks him, and balances out his idea. Vide
Franklin D. Roossvelt impatiently trying to pack the Supreme Court.

The system of three degrees of freedom—Political, Social and Religious represents a checks-and-balances system. In Russia, it's considered acceptable manners to eliminate permanently the losers in a political dispute—i.e., it's not forbidden by powerful Social strictures. At various times, Politics, Society and Religion each tries to overcome the "unduly hampering" activities of the other two.

Unfortunately, Society usually wins . . . and then settles down to stay that way, by eliminating its rivals. Politics and Religion are compelled to act

simply as rubber-stamp systems.

Any one of the three freedoms can become absolutely dominant, achieve immunity—and absolute immunity invariably produces absolute corruption.

Under the Nazis, Politics achieved near-absolute immunity level of domination; it didn't last long enough for us to see what an Immune Freedom does when it gets rolling. Mass production disassembly line techniques for destroying people was a beginning, but doesn't really represent a well-developed Immunity system.

Religión, when it's dominant, is at least as vicious. Human sacrifice is a really ancient proposition in history, whether it be Baal, in any of his disquises, or a fertility goddess. The Aztecs seem to have established the all-history high in rate of mass-production sacrifices, with 20,000 men, women and children sacrificed in the dedication of one temple. (Wonder if the hardworking priests who were butchering them got overtime pay?)

And when Society gets full immunity, it out-does them all, because to such a huge extent Society determines what people feel is right—the emotional feeling that appears as guilt when violated, and as satisfying goodness when fulfilled. Religion and politics try to gain control of that feeling-center;

Society usually manages to preempt control.

And when Society gains complete dominance, anything becomes not only acceptable, but a source of self-congratulatory satisfaction. The Alphastanese citizens who stone the social offender to death, and burn his wife on his funeral pyre, do so with a warm sense of good citizens doing their right and proper duty to the community.

Dean Swift's famous little "A Modest Proposal" purported to suggest solving the excess population pressure vs food shortage in Ireland at the time by selling the babies in the meat markets; thus roast baby would simultaneously attack the problem from both sides. The presentation was beautifully

logical.

And it is perfectly within the abilities of Social forces to make cannibalism a fully acceptable system. It has been in the past—and social forces are just as powerful today as any other time.

And no matter how high the level of a culture—either high ethically, or high technically—it will be dynamic or static, depending on the differentials within that culture, or between that culture and an effectively contacting culture. (The Iron Curtain is an effort to reduce the effective contact between the Soviet culture and those of the rest of the world. The deadly effect of tropical diseases prevented effective contact between the African Negro cultures and the geographically close high-level Egyptian cultural area for some 6000 years of history.)

No one of the three types of freedom can reduce to zero range, at any level, if the other degrees of freedom have appreciable range. That is, a very narrow-range social system cannot exist in a culture with both religious and political freedom. No one of the three can be static, while the others have

dynamic range.

But notice carefully that social status range is not equivalent to a wide differential in social freedom. What is more completely static than a lawe society, in which we have very-high-status masters, and very-low-status slaves? The thing that makes this a static society is that there is one and only one acceptable social pattern over-all. Introduce into such a culture an immigrant group which holds that slavery is wrong, or one that holds that slaves should be bred not only for work, but also for food, and the range of social ideas increases—and the culture becomes dynamic. The new ideas, notice, do not have to be higher than the old; they need only be different.

The United States, during the 19th Century, was a uniquely dynamic culture—because the range of social ideas was immense, the range of political ideas was equally extreme, and the religious freedom range was almost equally great. Think of the number of major religious belief systems that originated in the United States in one century, as compared to the rate at which major religious systems originated elsewhere and elsewhere in history!

The resultant cultural dynamism inevitably produced an immense economic growth, and a huge economic range—and a degree of technological advance

per decade never before achieved anywhere-anywhen.

At the mid-century point in the 20th Century, however, the situation in the United States is vastly different. The level of social, political, and religious factors may be vastly higher than it was a century ago—but the range of those forces is reduced to a tiny fraction.

While the citizen of the United States has a high level of political freedomthe difference between Republican and Democrat has been reduced to such a degree as to make the effect of political freedom less important. And conformity—i.e., extremely narrow range of social forces—has increased

unbelievably.

Since the social norm in this country is what can best be called "a liberal arts approach", this norm produces a major restrictive effect on scientific education—the young man who decides on a career in science or technology is, in a not entirely minor degree, a social rebel. And that effect exists in fact, despite the official pronuncements of the government that we need more scientists. What counts in such things is not what the government says, but what the people they live among say—and any sociologist swanting to de a valuable thesis might make a survey of opinions held by students at the girl's colleges in the immediate area of two men's colleges—a technical school, and a liberal arts school. Opinions need have no rational correlation with facts—but in a social system, opinions enforce themselves into facts! Unmannerly behavior is unmannerly because in our opinion it is unmannerly—and for no other reason whatsoever.

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And if the girls are found to hold the opinion that technical students are less interesting, less cultured, and boreing . . . for some reason the government's desire for more technical students is met by a steady drop in enrollment in technical schools.

And remember that, while the dear old bell-shaped curve of statistical distribution will continue to apply . . . the bell remains bell-shaped whether it's height-width ratio is 1 to 1 or 100 to 1—whether it's a broad, low distribution, or an excessively parrow distribution.

The essence of the question that must be evaluated in deciding whether any specific culture is a "free society" or not, then, is not a matter of political-legal matters alone.

It is perfectly valid to ask the question, "Is the citizen of the United States possessed of more freedom than the citizen of the U.S.S.R.?" And as of right

now, you don't have evaluated data enough to answer that!

The Soviet citizen definitely has greater social-range freedom than does the U.S. citizen. Russia is this century's melting pot, where a hundred different cultural enclaves have been vigorously stirred together. The rate of change of standard of living per decade in Russia brdicates an extremely high effective dynamism—which is, normally, associated with a broad-range-of-freedom system.

And be it remembered that the citizen of a static culture, no matter how tight the restrictions it imposes, feels his culture is free. Ask a primitive tribesman whether his absolute totalitarianism ritual-tabu society is restrictive! He thinks it isn't. To him, it looks like desirable and dependable law and order.

I repeat; you do not, as of now, have adequate evaluated data to know whether you, or Ivan, is possessed of greater net-overall freedom! Sure, Ivan's political system is much more restrictive—but ours is much more restrictive

than the complete political freedom of the Alphastanese!

The Soviet revolution smashed the intensely restrictive social system of Carsit Russia—and the co-operating, equally restrictive political, and religious system. They had to become atheistic, for the same reason the Romans had to smash the Jewish religion—which was completely contrary to normal Roman operations. The Jewish theocracy was, in effect, a functioning governmental system rigidity in opposition to the Roman political power. The Orthodox Church, in Russia, was completely aligned with the Carists social and political forces; it would have been a counter-revolutionary power of destructive magnitude if the Soviets didn't turn atheistic!

The result, today, is a very weakly structured social and religious system;

the highly restrictive political system may not, and from the extremely high dynamic achievement of the culture during the last 40 years it appears that it does not, offset the broad range of social and religious freedom.

Can you, in view of these factors—and in view of the abnormally high rate of progress per decade—assert with sound basis that the Soviet citizen "has no freedom"?

Freedom is not one, simple thing—and the right to vote is a quite minor portion of it.

THE EDITOR.